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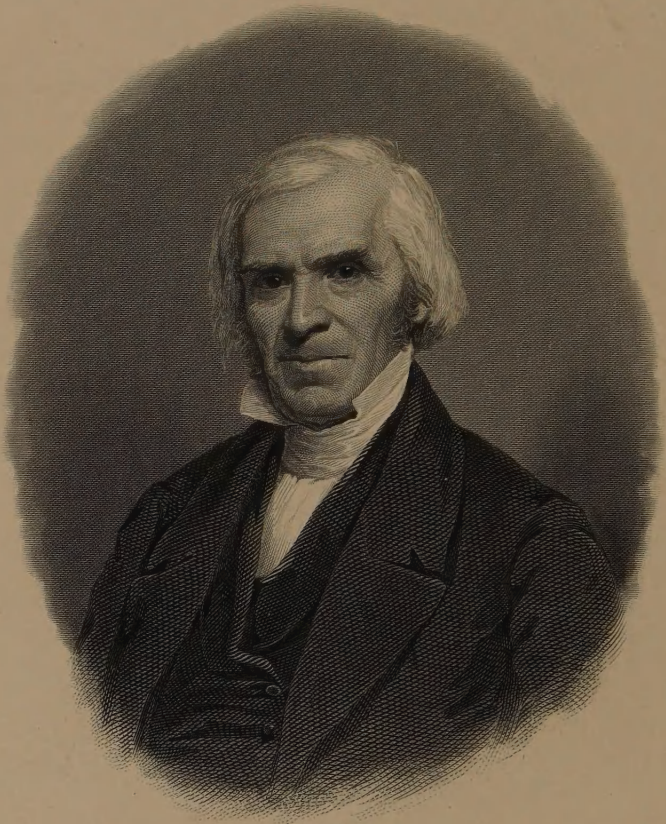
OF THE

SOUL AND INSTINCT,

AS DISTINGUISHED FROM

MATERIALISM.


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PHYSIOLOGY

OF THE

SOUL AND INSTINCT,

AS DISTINGUISHED FROM

MATERIALISM.

WITH SUPPLEMENTARY DEMONSTRATIONS OF THE DIVINE COMMUNICATION OF THE NARRATIVES OF CREATION AND THE FLOOD.

By MARTYN PAINE, A.M., M.D., LL.D.,

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TO

FLETCHER HARPER, Esq.,

TO WHOSE LABORS SCIENCE AND LITERATURE ARE GREATLY INDEBTED FOR THEIR DIFFUSION THROUGH THE PRESS,

THIS WORK IS MOST RESPECTFULLY DEDICATED

AS A TRIBUTE

TO HIS EMINENT WORTH, AND IN TESTIMONY OF THE HIGH ESTEEM ENTERTAINED FOR HIM

BY HIS FRIEND,

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PREFACE.

THIS work had its origin in a Lecture upon the Soul and Instinctive Principle introductory to the Author's course of Lectures on the INSTITUTES OF MEDICINE AND MATERIA MEDICA in the Medical Department of the University of New York, in the year 1848; at which time it was published by the Medical Class. In the Preface to an enlarged edition [1849] occur the following remarks:

"The Author has been actuated in the publication of this enlarged edition by the belief that no subject can offer greater interest to the whole human family; and from its intricacies and entire want of demonstration at the hands of Physiologists, and more especially on account of the prevalence of Materialism, he has supposed that a service might be rendered to every contemplative mind, to the Materialist himself, by affording reliable evidence of the existence of the Soul as an independent, self-acting, immortal, and spiritual essence.

"'That the intelligence of any being,' says D'Alembert, 'should be able to reason, till he loses himself, on the existence and nature of objects, though condemned to be eternally ignorant of them; that he should have too little sagacity to resolve an infinity of questions, which he has yet sagacity enough to make; that the principle within us which thinks should ask itself in vain what it is that constitutes the thought, and that this thought, which sees so many things, so *distant*, should yet not be able to see itself, which is so *near;* that self, which it is, notwithstanding, always striving to see and to know; these are contradictions which, even in the very pride of our reasoning, can not fail to surprise and confound us.'

"But more than all, the Author has supposed that, if the doctrine of Materialism can be shown to be erroneous, and a perfect

conviction of the existence of the Soul as an independent, self-acting agent can be established, it would hardly fail to enlarge and strengthen our conceptions of Creative Power, of our dependence upon that Power, and of our moral and religious responsibilities. Such a conviction, arising from demonstrative proof, which appeals to the senses as well as the understanding, it appears to the writer, has been wanted by the human family, however they may be disposed, in the main, to accede to Revelation, or to listen to the natural suggestions of Reason. If the writer has failed, he will enjoy the consciousness of knowing that he will have done no harm to morals or religion, and that the worst of the issue will be the trouble that may devolve upon others in restoring the subject to its former obscurities and consequent tendencies."

The second edition of the work on the Soul and Instinct, consisting of a small duodecimo, from the Preface to which the foregoing remarks are derived, has been before the public since 1849; and as the Author is not aware of any adverse criticisms, he offers this octavo edition in the belief that it will be found even more unexceptionable than the former. The facts and illustrations are greatly amplified, and the Author has aimed, so far as the subjects will admit, at a simplification that may adapt the work to the common understanding. He has also introduced a variety of topics which have appeared in some of his other works that have only an indirect, but, nevertheless, an important bearing upon the question relative to the Soul as distinguished from Materialism. Among the principal of these is the new doctrine of the "Correlation or Equivalence of the Physical and Vital Forces." If a principle of life be denied, in accounting for the endless and unique phenomena which appertain to the functions of organic beings, it is sufficiently apparent, independently of the avowed doctrines of materialism, that the phenomena of mind, from their connection with the same organization through which the functions of life are conducted, may be plausibly referred to the same physical causation. This doctrine of "Correlation of Forces" has therefore been made the basis of the "new materialism." Hence it becomes necessary to expose its fallacies.

As having important relations to the philosophy concerning the Soul, the doctrine of the origin of living beings in the ele-

ments of matter under the influence of physical causes, and the developmental doctrines of Darwin, Spencer, &c., must engage our attention; although well worthy of refutation for other obvious reasons, especially on account of their conflict with the laws of nature and with the Narrative of Creation.

The Narratives of Creation and of the Flood will be shown, demonstratively, to be literally direct revelations by the Creator, and that they were intended to be received in their obvious sense. The former is immediately related to our main purposes of establishing the substantive existence of the Soul as a self-acting agent, and a principle of life, as distinguished from external forces, or as the functional results of the organic mechanism; for it is expressly affirmed that "The Lord God formed man of the dust of the ground, and breathed into his nostrils *the breath of life; and man became a living* Soul." "So God created man in *His Own Image; in the Image of God created He him.*" This last affirmation was evidently intended to distinguish the image of man from that of the ape, and to thus anticipate the developmental schemes of His rational creatures. But more than that; for in immediate connection with the foregoing declaration, and apparently to enforce the distinction between man and the brute, and to indicate the supremacy of man, and that animals were created simply for his uses, he is authorized to "have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth."

In regard to the Narrative of the Flood, a primary object of the demonstration of its Divine Revelation is that of showing how it goes to sustain our position in relation to the Soul, since, as will be seen, it is the direct effect of the Narrative to corroborate the Divine origin of the Narrative of Creation.

The intended expositions of the Divine communications of these Narratives involve the necessity of a critical inquiry into many of the details. That of Creation, for example, must be shown to be literally true in its statements as to the creation of man and animals in a state of maturity, and that the production and organization of the earth are truly represented in the Narrative. But our demonstration of the Creation of organic nature will anticipate the Narrative in our exposure of the fallacies of spontaneous generation and the developmental doctrines. In re-

spect to the details relative to the Flood, we must look at the consequences of such a catastrophe, which will bring the Coal-formations under an elaborate consideration. But independently of the demonstrative relation of these subjects to the Narratives, if the Author be correct in his facts and conclusions, there will have been settled some of the grandest inquiries that can engage our attention.

But the foregoing Narratives are not introduced as at all necessary to establish our demonstrations in respect to the Soul, or the "Correlation or Equivalence of Physical and Vital Forces," or spontaneous generation, or any of the developmental doctrines of organic beings, but especially to show how exactly the Narrative of Creation corresponds in all its details with what is fundamental in Nature, and how that Narrative is sustained by the proof which establishes all the specifications in relation to the Noachian Flood.

In regard to the Author's work on *Theoretical Geology*, it had been once his purpose to have surveyed the ground in its greatest latitude of details; and with this intention he prepared a manuscript which would occupy two octavo volumes of six or seven hundred pages each. In the edition of his work on the *Soul and Instinct* [1849] there occurs the following reference to the work on Geology. Thus—

"Several years have passed since I expressed an intention of submitting to the world an examination of geological facts, with a reference to the statements in the Mosaic Records of Creation and the Deluge. I had then prepared a large work upon the subjects, in which all the facts of importance in Geology up to that period are reviewed, and none of them found, in my judgment, to conflict with the most obvious interpretation of the Narratives. I was led to make this attempt of reconciling the disclosures of Geology with what is revealed, and in its literal acceptation, so that it should meet with the consent of Science, from a conviction that it could be done only by one acquainted with Physiology. It has been the misfortune of those who have attempted this work by the force of Revelation to have defeated their cause and strengthened their opponents by glaring assumptions; while the Geologist has adhered to facts according to their supposed natural import, and founded theoretical speculations

upon them. The enterprise is surrounded with apparently formidable difficulties, which must be explained in conformity with facts and philosophy. The fruitful topics relative to the extent and orderly disposition of fossils and fossiliferous rocks, the general details attending the incrustation of the globe, the numerous and complicated '*enigmas* of the Coal-formations,' must be resolved according to natural laws; the Neptunian and Plutonic hypotheses must be disproved, and the Creation of the earth, according to the Narrative, placed upon such probabilities as shall not conflict with the analogies of Nature, though brought within the time assigned by the Mosaic Narrative. The Mosaic Genealogies of the human race must be also sustained, and it must be shown that there is nothing in Geology to contradict the supposed age of the earth as founded upon those Genealogies. If no error have crept into them since their revelation, they must be placed upon the same ground as the Narrative of Creation; while, also, they embrace a strong internal proof of their Divine origin, and are fully corroborated by the admitted brevity of man's existence upon the globe. This being shown, it will be readily seen that it reacts as a strong corroborating proof of the literal truth of the Narrative of Creation; and no small array of geological facts, and fundamental principles in Science, may be brought to the disproof of all theories which conflict with the obvious interpretation of the primeval history of the earth and its inhabitants down to the time of Moses. Indeed there is abundant evidence in the Coal-formations alone to subvert the whole system of Theoretical Geology, so far as it conflicts with the Mosaic statements; and the primitive rocks bear an overwhelming testimony that 'He spake, and it was done.' And coming to the constitution of organic nature, the acknowledged facts and principles in Science are an impregnable shield against every assault upon the literal interpretation of the Narrative of Creation.

"When I had thus nearly accomplished my undertaking, new professional avocations devolved upon me, other and laborious professional writings urged themselves upon my attention, which compelled me to lay aside my geological work. The subject, nevertheless, has been constantly more or less before me, that I might give greater maturity to the past by the progressive researches of geologists and by others executed by myself.

"I have thus made this explanation on account of my former allusion to the subject, and I will also add, that it is now my purpose to bring out an abridgment of the manuscript as soon as my professional avocations will admit, and to complete at my leisure the more enlarged work. I believe it is free from speculation, certainly from assumptions, nor has it been prepared without those practical observations which are indispensable to success in all difficult inquiries."

Subsequently, in the Appendix to the *Institutes of Medicine* (4th Edition, 1857), the Author, having referred to the published abstract of his work on *Theoretical Geology*, concluded with the following remarks:

"Should he think that the spirit of the times will justify the publication of the larger work to which he referred in his work on the Soul and Instinct, and which is now completed, he will submit it to the press. His main difficulty is the general concurrence of the Religious press in the revolutionary views of Theoretical Geology; though, in saying this, nothing more is intended than a simple representation of the facts. It is doubtful, therefore, whether a hearing can be obtained—certainly not a publisher at his own risk. The Author makes this statement in consideration of his former announcement that such a work was on hand.

"The abstract of the work on Theoretical Geology to which reference is now made is believed by the Author, and by better judges, to be incontrovertible. This is said, however, simply for the purpose of inviting a criticism which may either discourage the Author in a farther attempt, or prove to him an incentive to go on with his solitary work."

CONTENTS.

CHAPTER I.

Introductory Remarks, Opinions, &c.....Page 17

CHAPTER II.

Demonstration of the Soul..... 27

CHAPTER III.

The Doctrines in Materialism..... 90

CHAPTER IV.

Doctrines in Materialism, continued..... 100

CHAPTER V.

Materiality or Immateriality of the Soul..... 126

CHAPTER VI.

Correlation or Equivalence and Conservation of Forces.—Equivalence of Physical, Vital, and Mental Forces.—Matter and Force..... 140

CHAPTER VII.

Other and more direct Facts and Arguments in Materialism, and other Relative Grounds considered.—Organic Life.—Creation.—Spontaneous Generation.—Darwinism, &c..... 173

CHAPTER VIII.

The Facts and Arguments in behalf of the Materialistic Doctrines, continued.—Reign of Law.—Creative Law.—Darwinism.—Lamarckism.—Spinozism..... 220

CHAPTER IX.

Materialism, Pantheism, and Atheism pursued under various other Phases.—Opinions of Christian and Heathen Philosophers..... 274

CHAPTER X.

Materialistic Doctrines continued in their Relations to the Soul, to the Origin of Organic Beings, and to Pantheism.—Doctrines and Responsibilities of Theoretical Geology.—Heathen Philosophers, etc.—"Emancipation of Science from Theology"..... 318

CHAPTER XI.

Narratives of Creation and the Flood.—Their General Bearing upon the Doctrines of Materialism, and Progressive Development of Living Beings.—Theological Geologists.—Antiquity of the Earth.—The Telescope and the Stars .....Page 357

CHAPTER XII.

The Antiquity of Man in its Relation to the Soul, and the Supposed Gradual Development of Reason out of the Instinct of Animals 374

CHAPTER XIII.

Theoretical Geology, continued, in its Relation to Organic Beings, to the Developmental Doctrines, and to the Narratives of Creation and the Flood.—Theological Geologists resumed..... 411

CHAPTER XIV.

Analysis of the Narrative of Creation. — Its Internal Proof establishes the Existence of the Soul, and its own Literal Meaning throughout..... 456

CHAPTER XV.

Physiology of Instinct, according to Distinguished Writers..... 503

CHAPTER XVI.

Demonstration of Instinct, and its Distinction from the Soul..... 514

APPENDIX I.

The Creation and Organization of the Earth..... 549

APPENDIX II.

The Flood..... 604

APPENDIX III.

The Coal-Formations—Their Connection with the Narrative of the Flood..... 654

ABRIDGED GENERAL TABLE OF FOSSILIFEROUS STRATA.

(FROM SIR CHARLES LYELL'S "ANTIQUITY OF MAN.")

1. Recent	POST-TERTIARY	TERTIARY or CAINOZOIC	NEOZOIC	
2. Post-Pliocene.				
3. Newer Pliocene	PLIOCENE			
4. Older Pliocene				
5. Upper Miocene	MIOCENE			
6. Lower Miocene				
7. Upper Eocene.	EOCENE			
8. Middle Eocene				
9. Lower Eocene				
10. Maestricht Beds	CRETACEOUS	SECONDARY or MESOZOIC		
11. Upper White Chalk				
12. Lower White Chalk				
13. Upper Greensand				
14. Gault				
15. Lower Greensand				
16. Wealden				
17. Purbeck Beds	JURASSIC			
18. Portland Stone				
19. Kimmeridge Clay				
20. Coral Rag				
21. Oxford Clay				
22. Great or Bath Oolite				
23. Inferior Oolite				
24. Lias				
25. Upper Trias	TRIASSIC			
26. Middle Trias, or Muschelkalk				
27. Lower Trias				
28. Permian, or Magnesian Limestone.	PERMIAN	PRIMARY or PALEOZOIC	PALEOZOIC	
29. Coal Measures	CARBONIFEROUS			
30. Carboniferous Limestone				
31. Upper / 32. Lower Devonian	DEVONIAN			
33. Upper / 34. Lower Silurian	SILURIAN			
35. Upper / 36. Lower Cambrian	CAMBRIAN			

PHYSIOLOGY OF THE SOUL AND INSTINCT.

CHAPTER I.

INTRODUCTORY REMARKS, OPINIONS, ETC.

ALTHOUGH the present purports to be the third edition of the Author's physiological work on the Soul and Instinct, originally published in 1848, it is, nevertheless, rewritten and enlarged from the last edition (1849, a duodecimo of 173 pages), with a view to an extension of the facts, and to the relationship of the subject to momentous doctrines in Revelation. The Author has been also especially prompted by a desire of surveying the development and progress of materialistic ideas during the last twenty years. The present edition is therefore equivalent to a new work, with the former for its foundation. Since it was first submitted to the public, the new doctrines of the "Correlation or Equivalence of Physical and Vital Forces," the "Development of Organic beings" through the agencies of inorganic nature, "Creation by Law," the high "Antiquity of Man," and his primeval barbarity for tens of thousands of years, the fictitious nature of the Narratives of Creation and the Flood, and analogous projects, have been urged upon us; and since they all conflict with the revealed existence of the Soul, and a future state of being, and not less, also, with the existence of a Personal Creator, they have now been subjected to a careful examination, and brought to the test of facts and established principles in Science. The Author has also brought the Narratives of Creation and the Flood to bear with no little force upon his more immediate subject. In accomplishing this task he has incorporated the essential parts of his work on Theoretical Geology, published in 1856—having introduced into the text the internal proof embraced in the Narrative of Creation of its Divine Revelation and literal meaning; and has

assigned to the Appendices the facts which corroborate the statements embraced in both Narratives. Independently, however, of this special motive the Author has also aimed in the Appendices at the correction of errors that have benighted the history of our planet. But the latter topics are subordinate to the more ostensible objects of the work.

In the Spiritual Essence of man we meet with a subject upon which nothing has been yet said in proof of its existence but what Revelation and metaphysics teach, nothing of its physiological evidences, while Materialism has occupied the whole physiological ground, with the advantage of dedicating its labors to the senses and to the indolence of mankind; and while, also, there is not much encouragement for other subjects than those of a popular nature, especially for such as are recondite and involve more than an ordinary exercise of the mind. "The doctrine of Psychology, or the nature and properties of the Mind," says Dr. GOOD, in his *Book of Nature*, "is the most abstruse and intractable of all subjects that relate to human entity, or the great theatre on which human entity plays its important part; and, perhaps, so far as relates to the mere discoveries of man himself, remains, excepting in a few points, much the same in the present day as it did two or three thousand years ago."

May I, then, venture to speak of so intangible, invisible an existence as the Soul of man? I know that the demand now, more than ever, is for food for the senses. But shall *Materialism*, *annihilation*, have the whole of the game? Shall the Mind have no part in the chase—seeing, especially, that it is itself the intended victim? Shall I be told that I am infringing upon settled principles? That I am applying an extinguisher to great and shining Lights? Shall I be silenced by the denunciations against metaphysics? Shall it be said that Physiology has no relation to incorporeal existences? Have not physiologists employed their pens in describing the manifestations of Mind as the mere product of matter—mere eliminations from the blood by the intellectual organ? Are we not told that all the complexities of thought, and all that has ever been said, or written, or occupied the brain in silent contemplation, are owing either to a chemical process among the elements of the brain, or that they are merely a secreted product? And have we not patiently, credulously

heard them? But some will still say, what connection has physiology with spiritual existences? Certainly the same in relation to man as the merest physics, since the spiritual part is engrafted upon the material. It may not be as clear a subject for demonstration; since, especially, it is concerned about itself. Herein, indeed, have lain concealed the difficulties of the inquiry. The Mind has wanted a medium through which it may be seen independently of its own direct manifestations; and this neglect of the secondary aid has left the subject to the grasp of materialism, or exposed it to metaphysical speculations. Nevertheless, since nothing is known of material existences excepting through their manifestations, and as Mind is on common ground in this respect with all matter, and its manifestations incomparably more various, it would seem incontrovertible that more is known of Mind than of matter through its ordinary phenomena alone.

Mr. Locke presents this subject in his "*Human Understanding*" according to its unquestionable realities. Thus: "When we speak of any sort of substance, we say it is a *thing* having such or such qualities; as, Body is a thing that is extended, figured, and capable of motion; Spirit, a *thing* capable of thinking; and so hardness, friability, and ductility of iron, we say, are qualities to be found in a magnet. These, and the like fashions of speaking, intimate that the substance is supposed always *something* besides the extension, figure, or other observable ideas, though we know not what it is. Hence, when we talk or think of any particular sort of corporeal substance, as horse, stone, &c., though the idea we have of either of them be but the complication or collection of those several simple ideas of sensible qualities which we find united in the thing called horse or stone, yet because we can not conceive how they should subsist alone, nor one in the other, we suppose them existing in and supported by some common subject; *which support we denote by the name* SUBSTANCE, though it be certain we have no clear or distinct idea of *that thing* we suppose a Support. The same happens concerning the operations of the Mind; namely, Thinking, Reasoning, Fearing, &c., which we, concluding not to subsist of themselves, nor apprehending how they can belong to the Body, or produced by it, are apt to think the actions of some other substance, which we call Spirit; whereby yet it is evident, that, having no other idea or notion of matter,

but *something* wherein those sensible qualities which affect our senses do subsist, by supposing a *Substance* wherein Thinking, Knowing, Doubting, and a power of reasoning, &c., do subsist, we have as clear a notion of the *Substance of Spirit* as we have of the Body; the one being supposed to be (without knowing what it is) the Substratum to those simple ideas we have *from without*, and the other supposed (with a like ignorance of what it is) to be the Substratum to those operations we experiment in ourselves *within*. It is plain then, that the idea of *corporeal* Substance in matter is as remote from our conceptions and apprehensions as that of *Spiritual Substance* or Spirit; and therefore from our not having any notion of the *Substance of Spirit*, we can no more conclude its *non-existence* than we can for the same reason deny the existence of the *Body;* it being as rational to affirm there is no Body because we have no clear and distinct idea of the Substance of matter, as to say there is no Spirit because we have no clear and distinct idea of the *Substance* of a Spirit."*

But the manifestations of Mind are, as I have said, incomparably more various than those of matter, and, therefore, according to our premises, more is known of the former than of the latter. This induction will be more fully presented when I come to the consideration of those physical peculiarities of living beings which distinguish them from the members of the inorganic kingdom. But we may not lose sight, at present, of the general fact that a common method of reasoning applies to all our inquiries into the existence and nature of all things, whether material or immaterial. Our reasoning is alone interested about their manifestations or phenomena, and in proportion to their variety and the distinctness with which they are pronounced will our conclusions rest upon a substantial foundation. This great rule was violated by the author of the celebrated ideal theory, who, in yielding to the transcendent light of the phenomena of Mind, rejected the testimony which matter offers to the senses, and admitted only the existence of the Soul and a Creative Power. That which comes to us under the aspect of external material objects was referred by BERKELEY

* Whenever an emphasis is made upon words as they occur in quotations, should it affect their usual import, I desire that it may be considered as mine. In the mean time I may say, that the object generally is to aid the reader in the intended application of the quotation.

to the Mind, as simply impressions made upon our Minds by the Supreme Being, in virtue of certain established laws; and therefore, what are denominated material objects exist only in the Mind. But the Mind requires no such factitious aid, while, by the same violation of philosophy, the converse may be brought, as in the following quotation, to the support of materialism. To all who are disposed to regard themselves in the lofty condition in which the Creator has placed them, no other evidence of the *substantive existence and self-acting* nature of the Soul should be necessary than *consciousness*, *sensation*, and *voluntary motion*.

On the other hand, notwithstanding all the unique manifestations of Mind, no one of which is analogous to any of the recognized phenomena of matter, it is a common expedient with the Materialist to assume that we can not extend our inquiries beyond those phenomena which come to us through the recognized conditions of matter. It is true, this is often expressed in an equivocal or insinuating manner, as if the writer intended a certain reservation upon which he may fall back upon exigencies like the foregoing. Thus, one of the latest and highest authorities, Professor T. H. HUXLEY, remarks, in his Lecture on the *Physical Basis of Life* (1868), that—"If we find that the ascertainment of the order of nature is facilitated by using one terminology, or one set of symbols, rather than another, it is our clear duty to use the former, and no harm can accrue so long as we bear in mind that we are dealing merely with terms and symbols. In itself it is of little moment whether we express the phenomena of matter in terms of spirit, or the phenomena of spirit in terms of matter. *Matter may be regarded as a form of thought, thought may be regarded as a property of matter.* Each statement has a certain relative truth. But with a view to the progress of science, the materialistic terminology is in every way to be preferred; for it connects thought with the other phenomena of the universe, and suggests inquiry into the nature of those physical conditions, or concomitants of thought, which are more or less accessible to us, and a knowledge of which may, in future, help us to exercise the same kind of control over the world of thought, as we already possess in respect of the material world; whereas, the alternative, or spiritualistic terminology, is *utterly barren, and leads to nothing but obscurity and confusion of ideas.* Thus there can be little doubt

that the farther science advances the more extensively and consistently *will all the phenomena of nature be represented by materialistic formulæ and symbols.*"

Materialism has one specious advantage, in its conflict with the phenomena of Mind, in the fact that the manifestations of matter address themselves to the senses directly from the matter itself, while all the sensible phenomena of Mind come to us through the medium of matter. The antecedent, originating action of the Mind is disregarded, while the sensible consequences are alone considered. The Mind has wanted exemplifications derived from the operation of physical causes parallel with such as emanate from the action of Mind upon the voluntary and involuntary organs—a substitution, as it were, of physical agents for the Mind itself. It is my purpose, therefore, to present examples of the manifestations of matter through the same anatomical structure as employed by the Mind, and corresponding with the mental phenomena. In the mean time it should be understood that the doctrines in materialism refer exclusively to the brain, and that of these doctrines there are two; one of which supposes that all the manifestations of mind are owing to a chemical process among the elements of the brain, and the other that those manifestations are a secreted product of that organ, and are, therefore, on common ground with bile, saliva, &c. These doctrines completely overlook the fact that they necessarily suppose that the brain is as much a *self-acting* agent as has ever been surmised of the Soul; and in giving rise to all the endless manifestations of Mind, that it is so far equivalent to the Soul of the spiritualist. The Materialist assigns no exciting cause of those special cerebral actions which are supposed to give rise to the displays of Mind, and admits that the brain supplies no indication of such a cause.

Thus the Materialist has been guilty of the blunder of investing the brain with a self-originating power over its own actions, in violation of all that is known of matter, living or dead, and has elaborated a doctrine which ascribes to the brain all that has been claimed for the Soul in the most transcendental philosophy. The brain and nervous system, in being the media through which the Soul and Instinctive Principle conduct all their operations, naturally inspire the Materialist with great admiration; for, indeed,

the brain alone, as the seat and organ of the Soul, transcends in sublimity all that is known of the mechanism and laws of the Universe—its presiding Spirit approaching in near sublimity its Almighty Prototype, or as pronounced by ADDISON—"The Soul, considered with its Creator, is like one of those mathematical lines (the asymptotes of the hyperbola) that may draw nearer to another for all eternity without the possibility of touching it; and there can be no thought so transporting as to consider ourselves in these perpetual approaches to Him Who is not only the Standard of perfection, but of happiness."

I say, therefore, it is peculiarly the duty of the Physiologist to refute all the purely physical doctrines of Mind, and to point out, as well as he may, the characteristics of the "Divine part" of man, and its relations to the body. The inquiry concerns, immediately, many momentous problems in physiology and the healing art; and may be turned, indirectly, to the morals, the dignity, and the happiness of society, to the general cause of Religion, and to the special glory of the Almighty.

But the Physiologist should steadily consider Mind in its relations to the body. Heaven, alone, can look upon Mind in its abstract condition; and of this, as I have said, the Materialist has taken an advantage. As presented to the Physiologist, the compound nature of man is the most lofty, as it is the most noble inquiry; and however recondite it may be, it may be laid open to the understanding of all. Not that it is in the power of finite reason to comprehend the manner in which the Soul is associated with the body, or how it exerts its effects; but we may look at these relations and results through the medium of the phenomena, and understand them as well as any other designs in nature. If we know nothing of the Soul's essence, neither do we of the essence of matter; but we know that it is the fountain from which has issued all that imparts the least value to man, and all that degrades him below the level of the beast—all the knowledge that makes up the civilization of mankind, on the one hand, and, on the other, all the vices and crimes which form so foul a stain on that civilization. The body simply renders a subordinate service; the brain being the Soul's principal instrument. The Rational Faculties, in seeming independence, work out the problems of thought, while the Will takes up any suggestions they may

make for the co-operation of the body, and calls upon the senses and voluntary muscles for their servile work.

"Of all organized beings," says LAVATER, in his *Essays on Physiognomy*, "with which we are acquainted, there are none in which are so wonderfully united the three different kinds of life as in man—the animal, the intellectual, and the moral. Each of these lives is the compendium of various faculties, most wonderfully compounded and harmonized." "To know, to desire, to act, or to observe and meditate accurately, to perceive and wish, to possess the power of locomotion and resistance—these, combined, constitute man an animal, intellectual, and moral being. Man, endowed with these faculties, with this triple life, is in himself the most worthy subject of observation, as he likewise is himself the most worthy observer. In him each species of life is conspicuous; yet never can his properties be known except by the aid of his external form, his body, his superficies. How spiritual, how incorporeal soever his internal essence may be, still he is only visible and conceivable from the harmony of his constituent parts. From these he is inseparable. He exists and moves in the body he inhabits, as in his element. *This material man must become the subject of observation before we can study the immaterial.*"

So far Lavater, who confined himself to the surface alone; proceeding upon the simple proposition that—"The organization of man distinguishes him peculiarly from all other earthly beings; and his physiognomy, that is to say, the superficies and outlines of his organization, show him infinitely superior to all those visible beings by which he is surrounded."

Such, then, being the external characteristics of man, the mere outline of an organization which he enjoys in common with the brute, what shall be said of that internal Essence whose highest attributes have no analogies in the brute creation? It is this great prerogative, and the relation of the immaterial to the material part, which it is my first object to consider. I shall distinguish, therefore, what has been commonly designated the spiritual from the material man, though it be obvious that, however spiritual, how incorporeal soever, the internal essence may be, it is yet inseparable, in the present life, from the mechanism of the animated body. I shall carry the distinction farther than is rec-

ognized by other Physiologists, and shall endeavor to sustain my conclusions by facts alone. I shall not, therefore, entangle the reader in any metaphysical obscurities, nor shall I, like the Materialists, assume imaginary data, nor, like them, reason from factitious analogies. On the contrary, I shall endeavor to adhere to the legitimate rules of "positive philosophy."

It must be allowed a misfortune that the subject of Mind, as distinguished from matter, has been in the keeping of Metaphysicians. Learned, and able, and devoted as they may have been to the prerogatives of Reason, and with all the lustre they have shed upon Mind, they have considered the spiritual part of man too abstractedly from his organization. This has contributed to the reaction which now assumes the form of undisguised materialism. Nor is that all; for with the correlative aid of innovations upon the science of organic life from the philosophers who reduce the whole to the maxims of physics, the more revolting doctrine of spontaneity of living beings or creation by the physical agencies of inorganic nature, or, as also expressed, by "creative law," not only takes a leading rank in the science of life, but is even practically illustrated in the manufactured animal upon which Science has bestowed the name of its creator—the *Acarus Crossii*—side by side with the *Homo Dei!*

I have said that the bold materialism of our age is, in no small degree, the parent of the greater evils; and, that the extent of the doctrine both as to the Soul and Organic Life may be distinctly seen, and its fallacies exposed, I shall quote several of our most applauded authors. To many, I have no doubt, the opinions will be new and startling, and the more startling as *materialism* necessarily carries with it the doctrine of *annihilation.* The consequences to which I have already adverted are among the causes which have contributed most largely to the turbulent movements of the world; and they are urged upon us as the fruits of a high advance in science or of civilization. I say of the world in its most comprehensive sense; for the revolutionary spirit is not confined to general literature and philosophy, but strikes at the more absolute foundations of society. It has reached the purlieus of popular factions, and hails an *Ilias Malorum* as its proudest trophy. In its wildest desolation it was shadowed forth by the prophetic ken of Genius relying upon Retributive Justice—

'Vengeance, vengeance will not stay!
It shall burst on Gallia's head
Sudden as the Judgment-day
To the unsuspecting dead.

"From the Revolution's flood
Shall a fiery dragon start;
He shall drink his mother's blood,
He shall eat his father's heart.

"Nursed by anarchy and crime,
He—but distance mocks my sight!
Oh—thou great Avenger, Time,
Bring thy strangest birth to light!

"Prophet! thou hast spoken well,
And I deem thy words divine."

Although for many of the evils to which I have referred we can readily assign the proximate causes, it is not so easy to comprehend the obliquity which sees nothing but matter in the constitution of Mind, and nothing but accident in Living Beings. In ascertaining the ability and arguments of those who seek for fame by flooding society with the most demoralizing opinions, I shall quote freely from the Propagators themselves, and bring to my aid the judgment of those who have devoted themselves to the study of the human character. I would not, however, depend upon any other means for restraining the outpourings of error than the logic of facts; and although Truth has been said to lie at the bottom of a well ("*latet in puteo*"), if there be any thing settled in its maxims, it is certainly the one which enjoins the duty of cultivated minds to employ their learning and reason in enforcing the spirituality of man and the destinies which await him in another life. And as to Religion and morals which are founded upon something more than a substratum of matter, it was the opinion of Addison in his times, (which was never more applicable than in our own,) that—"All the arts and sciences, (instead of being perverted to an opposite effect,) ought to be employed in one confederacy against the prevailing torrent of vice and impiety; and it will be no small step in the progress of Religion, if it is as evident as it ought to be, that he wants the best taste and the best sense a man can have who is cold to the beauty of holiness."

CHAPTER II.

DEMONSTRATION OF THE SOUL.

ACCORDING to the plan of our work I shall now proceed to demonstrate the *Substantive Existence and Self-acting* nature of the Soul. As the premises include the organization of the Body, something must be said of its constituent parts and functions, and the laws which they obey.

The animal body consists of two groups of organs, one of which is essential to life, and is composed of the organs of the so-called Organic Life; the other, which is not necessary to life, is composed of organs which subserve the uses of the Soul and Instinctive Principle, and are known as the organs of Animal Life. Nevertheless, the most important of these non-essential organs, the brain and nervous system, the very throne of the Soul, is rendered tributary to the functions of all the organs of organic life; while the vessels of nutrition and absorption, which belong to the group of the latter, pervade all parts of the organs of animal life.

The animal and vegetable kingdoms possess, in common, the properties and functions which are essential to organic life. There may be the greatest variety in the organic structure throughout the animal and vegetable tribes; but the functions in the department of organic life are everywhere the same. They consist of *motion*, *absorption*, *assimilation*, *distribution* or circulation, *appropriation* or nutrition and secretion, *excretion*, *calorification*, *generation*. The organs that do not belong to plants, and therefore engrafted upon the organic life of animals, are the nervous system, the organs of sense, and the voluntary muscles. But there is, in reality, only one life, and of this the plant has as much as man and animals; and although the organs of animal life make up all that is elevated in man and animals above the vegetable world, those of organic life form the basis of what is peculiar to animal life. The distinction is simply convenient, as denoting a number of organs that appertain, more or less, to the ani-

mal kingdom which are not necessary to life, and which do not belong to plants. All those, indeed, that are peculiar to man and animals, the nervous system, &c., are constituted upon the same plan of organic life, and carry on the same essential functions of life as all other organs. But to the so-called organs of animal life have been added certain other functions to carry out the special designs of animal existence.

Nothing can be inferred as to the functions of an organ from its anatomical structure. All that knowledge comes from an observation of their phenomena or manifestations; and in this manner we learn that the brain has not only all the vital or organic functions, and influences the essential organs of life, but is also the seat of sensation, and of the rational and instinctive faculties. These faculties are familiarly known as *judgment*, *reflection*, *comparison*, *imagination*, *perception*, *understanding*, *will*, *memory;* the first four of which are especially characteristic of Reason. The whole collectively make up the properties of the Soul, and the last four the properties of the Instinctive Principle; though a feeble degree of reflection is manifested by animals, as seen in their displays of memory, and in the manner in which they seek their food through associations with a former experience.

The various properties of the Mind are more or less concerned in the intellectual functions, and some of them, as the *will* and *memory*, are distinctly associated in man with the operations of judgment, reflection, &c., and consequent upon them. The *Passions*, also, refer themselves to the *Mind*, but only relatively so, as determined by some act of the Mind in its collective sense. As the Will and the Passions, however, are important elements in my demonstration of the Soul, I shall employ them in the sense of mental attributes, for the sake of brevity and of being clearly understood; while, as will be seen, it is entirely unimportant to the demonstration whether they be merely the results of mental processes or distinct faculties of the Mind.

Of my immediate premises in relation to the Soul and Principle of Instinct I may explain that I regard both reason and instinct as belonging to man, and instinct alone to animals. Nevertheless, instinct exists in man, as will be seen, in a degree far inferior to reason. *Mind* is commonly regarded as synonymous with *Reason*, and Instinct a principle by itself. The latter is un-

doubtedly true of all animals; but I consider Instinct, in relation to man, as a property of the Soul, while in animals it is shorn of the great distinguishing attribute of man, the rational faculties. To simplify the discussion of this intricate subject, the word Mind, with the foregoing explanation, may be applied indiscriminately to man and animals. Judgment and Reflection are the great characteristics of Reason; but contrary to the usual acceptation, the Understanding belongs as well to the Instinct of animals as to the human Mind. Many may be disposed to consider the Understanding a function rather than a property of the Mind; but as the rational faculties are interested in man along with the exercise of the Understanding, if it were regarded as a function of those faculties the same interpretation would fail of application to the Instinctive Principle. The true philosophy appears to be, that, while Perception takes cognizance of the cerebral impressions that come through the senses, the Understanding in animals simply appreciates their nature. But in man Reason, along with the Understanding, takes charge of the sensations, and thus multiplies an endless amount of knowledge. Perception, therefore, is necessary to give any appreciable effect to the impressions which come to the brain through the organs of sense; and the results of the co-operating causes is known as Sensation. It should be explained, also, that Sensation is distinguished into *common* and *specific*. The nerves are the means by which impressions are transmitted to the brain, and their expanded extremities, at their origin in the brain and their termination in the organs of sense, are the parts most important to sensation; the trunks serving mainly as conductors. This is also true of the nerves concerned in voluntary motion, and of the involuntary movements that are excited by the nervous influence.

Common sensation appertains to all parts, and is the cause of pain. In the natural state of the body it is inappreciable, but may be greatly roused by injuries and by disease. Its intensity will depend upon the nature of the part and of the exciting cause. It is apt to be most exquisite in parts where *specific* sensation is least; as in tendons, ligaments, membranous tissues, &c.

Specific sensation is the function through which we acquire a knowledge of external things, and is, therefore, the great inlet of knowledge. It has, of course, several modifications, consisting,

indeed, of apparently five different functions. The expanded nerves of sense, it may be superfluous to say, are supplied with auxiliary means, such as the various appendages to the retina, to the auditory nerve, &c. A close analogy exists among the whole, and they may be brought more or less to the aid of each other. Although a common function, its remarkable modifications are shown by their uses, respectively, and by the necessity of certain specific stimuli for each.

Perception and the Will are the principal mental properties which contribute to the phenomena of animal life. Perception is always necessary to true sensation, and therefore to the exercise of the senses. The Mind must perceive an impression transmitted to the brain from an organ of sense, and consciousness must operate before the impression can be realized. The Mind itself is therefore, of necessity, acted upon in cases of true Sensation through the impressions made upon its organ, and thus brought into action. The Will exemplifies yet further the complexity of the principles which obtain in the animal kingdom; and its phenomena admonish us to pause over that materialism which sees nothing in the manifestations of mind but the demonstrations of physical and chemical power. It presides in animal life, and governs the movements of the voluntary muscles. All muscular movements which are not excited by the Will depend upon other causes. Voluntary motion is, therefore, as dependent on the Will as true sensation is upon Perception. The Will has very little operation in organic life, though the Passions operate powerfully upon the heart, the abdominal organs, &c. This peculiarity is founded in consummate Design, since greater latitude to the Will would be incompatible with life; while, on the other hand, the Passions and Emotions are allowed, for useful purposes, to stretch their influences to the deep recesses of life.

A proper understanding of my demonstration requires some knowledge of the least recondite of the laws of the nervous system, and a close attention to the relations of my facts and their logical consequences. The evidence turns wholly upon physical or physiological facts, and my essential premises are relative to the nervous system. These have been deduced from the most accurate and multiplied experiments, and are admitted by all. Their simple statement will enable most readers to comprehend

all that is necessary to an understanding of the demonstration.

First, then, the brain is especially subservient to the Soul and the Instinctive Principle; or an equivalent ganglion takes the place of a brain in the lower orders of animals. Although, therefore, the brain is the organ through which the Soul and Instinct carry on their functions, there could be no thought, no instinctive or voluntary act, unless the brain were brought into operation by some *Self-acting*, intelligent agent. The brain, therefore, as it is my purpose to show, is, in its intellectual and voluntary acts, simply subordinate to that agent, and variously so as the act may be purely intellectual, or relate to the voluntary muscles. All this is denied in Materialism, which supposes that the brain produces the phenomena of Mind without the aid of any such exciting or co-operating cause. No one doubts, however, that the brain, or an equivalent ganglion in the lower orders of animals, is indispensable to all the manifestations of Mind. But whatever may be the reality, the instrumentality of the brain is apparently greater in the functions of the Will and Perception than in those of Judgment, Reflection, and Imagination; though a natural condition of that organ is especially necessary to a proper exercise of the rational faculties. But the greatest final cause of the brain in respect to the connection of the Soul with the body, and especially the Instinctive Principle, is to serve as a medium of communication with the voluntary muscles through the nervous influence. The Will is, therefore, a stimulus to the brain, as are all the mental faculties, while this organ supplies, in consequence, the nervous influence by which the voluntary muscles are brought into action by their own inherent power. In respect to Perception, we discover the relation of the Mind to the brain in another aspect, and also another analogy between the Will and physical agents as vital stimuli. Through that property of the nervous system known as sensibility the brain is acted upon when influences are transmitted by the senses, and the impression thus made rouses the Mind, or its property Perception, and sensation is the resulting effect.

The Will, in all its manifestations upon the voluntary muscles, rouses the brain into action, develops the nervous influence and directs it upon the organs that are set in motion. It is equally

so in man and animals; but in the former the Will is so extensively concerned in the processes of Reason as to exalt it far above its subserviency to the latter. This variety in the functions of the Will, and which is demonstrable in respect to the muscles, is very expressive of the relations which the Soul and Principle of Instinct bear to the brain, though operating in animals in the lower aspect of volition. But its combined prerogatives in man show us forcibly the *self-acting* nature of Mind, and that the brain in its relations to the body is especially designed as a medium through which the Soul and Instinctive Principle may govern the animal fabric; while the senses do the mutual office, through the same medium, of conveying impressions to the immaterial part.

Secondly—In immediate connection with the brain is the medulla oblongata into which the brain converges at its base, and which is second only in importance. This medulla is prolonged into the spinal cord, the next in importance. These prolongations from the brain, and the nerves which depart from them, and certain nerves which depart immediately from the brain, are, among other uses, the organs through which the Will transmits its influence to the voluntary muscles. These various nerves are, also, in their connections with the brain, the seats of sensation; and the whole together are denominated the *cerebro-spinal* system.

This general outline as it respects the great central parts of the nervous system is all that is necessary to the demonstration before us. They have all, more or less, a concurrent participasion in the acts of the Will, while the *ganglionic or sympathetic* system of nerves, (of which I shall soon speak,) along with its great centre the brain, are the main channels of the passions. The medulla oblongata in its connections with the brain has important relations to the Will, as well, also, to physical causes acting upon the brain, when either develops motion in distant parts; or it may be essentially the source of motor influences, as in the function of respiration. But it is of no manner of importance to my demonstration as to how far the medulla oblongata, or special parts of the brain itself, may be concerned in the acts of the Will and Passions. But these details should be understood. I shall therefore speak of the brain alone in referring to mental func-

tions and to those reflex actions in which the brain and medulla oblongata participate.

Thirdly—Another system of nerves to which I have briefly referred, the ganglionic or sympathetic, having also, like the cerebro-spinal nerves, the brain for its principal centre, is designed, in part, to connect together in harmonious action the involuntary organs, or those of organic life. It is also through the sympathetic nerves especially that the Passions display their effects, but not so the Will. The Passions may also operate upon the voluntary muscles through the cerebro-spinal nerves, as seen in their various manifestations in the muscles of the face; though the Will may be more or less interested in these phenomena.

Fourthly—The cerebro-spinal and sympathetic systems of nerves are intimately blended with each other, so that the brain is the great centre of both systems, and the spinal cord a less general centre, while the ganglia of the sympathetic nerve are local centres to that nerve.

In consequence of the foregoing union of the two systems of nerves, the cerebro-spinal system has certain organic influences upon the essential organs of life. Mechanical or other physical irritation of the brain or spinal cord may thus be transmitted directly to the voluntary and involuntary organs; and the Passions, but not the Will, by their direct action upon the brain, may readily affect these essential or involuntary organs through the sympathetic nerve.

The influence of irritations of the expanded extremities of the sympathetic nerve may be also transmitted to the voluntary muscles through the circuit of this nerve and the brain and spinal cord, as seen in the convulsions of children, arising from dentition or from intestinal irritation, or when disgust, by nauseating the stomach to the extent of vomiting, convulses the abdominal muscles.

It appears, therefore, that the brain has an important secondary agency in the functions of organic life, although especially designed for the Soul and Instinct. And herein we witness a sublime manifestation of the comprehensiveness of Design, and in all its unity of purpose, in rendering the intellectual organ not only subservient to the animal mechanism, and that mechanism reciprocally so to the Mind, but tributary to the uses of the whole

organic system, upon which, indeed, its own life depends. Reason and Instinct would avail but little were their functions circumscribed by the limits of their organ. Hence the brain is prolonged into nerves, and various connections are thus established with all parts of the body and with the external world. These prolongations are designed for the simple purpose of adapting us to the physical conditions of this mundane sphere, and have no participation in abstract intellectual processes. The brain alone is interested in the acts of judgment, reflection, memory; and this, when associated with the consideration of the *self-acting* nature of the Soul and of the obvious final cause of its connection with the brain, would seem to be a near approximation to a possible existence of the spiritual part in total independence of the body.

The brain being also on common ground with all other organs as to its means of sustenance, the design would still be defective, and the economy of nature obviously violated, were not an organ so prominent in the animal mechanism rendered subservient to the great purposes on which its existence depends. Therefore that other system, the ganglionic or sympathetic nerve, has been established, with intimate connections with the cerebro-spinal, through which they co-operate together in influencing the functions of all parts of the body. Nevertheless, the essential nervous influences in the organic processes of life devolve mostly upon the sympathetic system, whose principal offices consist in harmonizing the actions of the various organs, and in so modifying their functions as to variously affect the secretions in their quantity and quality, and in supplying the stimulus of the nervous influence to the muscular tissue in organic life, while that of the voluntary muscles, in acts of voluntary motion, is supplied by the cerebro-spinal system.

Here I may stop for a moment for the purpose of saying that much has been lately written to show a correspondence between the Size and Structure of the brain and the Rational and Instinctive functions. This is true, in a limited sense, of the size of the organ in man, both as to the difference in Mind between man and animals, and among individuals of the human race. The extremes in the capacity of the skulls of men have been found to vary from 62 to 114 cubic inches, while those of the few gorillas examined, and which have the nearest approach to the capacity of

the human skull, vary from about 24 to 34 inches. But we have no knowledge that there is any gradation in the instinctive faculties of particular species of animals conforming to the relative size of the brain among different individuals of the species; but just the contrary is shown by the high development of Instinct in the new-born animal.

Indeed, nothing can be predicated in respect to Instinct either of the size or the structure of the brain, and nothing as to Reason of the structure of the organ. The variety in both respects is very great; extending from the simplest form of a ganglion in the insect to the highest development of the brain in man; while in the tribe of apes the structure approaches near to that of the human brain. And since, also, the organ has such important relations to the senses, the voluntary muscles, and the great organs of life, who shall define how far its varieties in structure are tributary either to Reason or the Instinctive Principle? Phrenology, in its details, is a failure. But the most conclusive answer, both as to size and structure in animals, is rendered by the wonderful history of the instinctive manifestations of the honey-bee. Nor can I cite a better opinion than that of Sir CHARLES LYELL, who says in his "*Geological Evidences of the Antiquity of Man*" (1863)—that—

"The extraordinary intelligence of the Elephant and Dog, *so far exceeding* that of the larger part of the Quadrumana, although their brains are of a type *much more remote* from the human, may serve *to convince us how far we are as yet* from understanding the real nature of the dependence of intellectual superiority on cerebral structure."

Nevertheless, as the brain, according to our premises, is especially designed for intellectual and instinctive purposes, and is only incidentally associated with all other parts to establish certain special relations with them and with surrounding objects —with the senses as tributary to the Mind, with the voluntary muscles as the means of fulfilling other external relations, and with the organs of organic life to maintain the foregoing purposes —in consideration of all this, I say, it is in the highest degree probable that the brain is the seat of *something* which reaches far beyond the mere conditions of matter, and that *that something* may be capable of an existence without the mechanism with

which it is associated for the purpose of connecting it with the surrounding world; though, as will be seen when I come to the subject of the Instinctive Principle, there are reasons for supposing that Instinct perishes with the death of the body, while other reasons show as probably the immortality of the Soul. But all this, independently of Revelation, is only inferable from final causes, and the analogies between the human and Divine Mind, and is not demonstrable. I shall therefore ask for it only a corresponding importance, and proceed with the demonstration.

From what has been said, it appears that one of the great secondary uses of the brain and spinal cord and their nerves is that of co-operating with the ganglionic or sympathetic in establishing a circle of sympathies among the various organs of the body and preserving the whole in a harmony of action that is indispensable to the life of complex animals.

Thus we learn that the various parts of the organic mechanism of man and animals are not only indispensable to each other, but that a certain established influence of one upon the other through the medium of the nervous system is necessary to each, and the functions of the whole may be fatally deranged, either by causes that may interrupt the common chain by which the relations are established, as directly by a blow upon the head or by division of the sympathetic nerve, or indirectly, as by a blow on the region of the stomach, or by poisons acting upon that organ, and whose effects are felt perniciously by the brain. Whatever, indeed, may embarrass the organic functions of the brain will more or less disturb this concert of action, may modify the functions of every part, and derange the whole series of vital phenomena. The nature of the disturbances will depend entirely upon the nature of the impressions produced upon the nervous system, as well as upon the rapidity and violence with which the impressions are made. Direct injuries of the brain or nerves do it in one way, and according to their nature and extent. Morbific or other causes acting upon other parts affect the nervous centres, and consequently give rise to remote derangements in other ways, and according to their nature and the violence with which they operate. Medicines do the same thing, and according to their nature, their dose, and according to the nature of the part, as well as the existing state of the part to which they are applied, or that

of other parts upon which they may act sympathetically. Intricate reflex nervous influences, in all these cases, are liable to spring up, and that, too, in rapid succession. Now, as will be seen, the Will and the Mental Emotions are exactly on common ground in their production of physical results with all the preceding physical agents—the Will influencing the voluntary muscles through direct action upon the brain, and Mental Emotions affecting the heart, stomach, intestines, &c., through the same direct action. Involuntary motions may also arise from certain associations of *ideas*, and which appear to be independent of the will or mental emotions, as witnessed in sympathetic yawning on seeing another yawn. But some emotion is apt to arise in these cases, as in vomiting on seeing another vomit from the effects of an emetic, when the emotion of disgust determines the paroxysm. The same laws, precisely, are concerned throughout.

Fifthly—Both the cerebro-spinal and sympathetic are composed of nerves of two kinds; one of which transmits the influence of the Will and of the Passions, and the effects of other causes, from the nervous centres towards the circumference, while the other kind transmits impressions from the circumference to the nervous centres. The first of these two orders of nerves are concerned in the development of voluntary and many involuntary motions, and are hence called *excito-motory* nerves. The second order are nerves of sensation, or *sensitive* nerves; though the influences transmitted by them are *felt*, in the natural state, only when propagated through the nerves which supply the organs of sense; and the act of the mind known as Perception is necessary to true sensation. It should be also remarked that, while some of the two orders of nerves are wholly or mostly of one kind or the other—either *excito-motory* or *sensitive*—a very large proportion of the nerves are composed of fibres of both orders, bound up together in a common sheath, though perfectly distinct from each other in arrangement and function. Such is the case with the nerves which go off from the spinal cord and the great sympathetic and pneumogastric nerves, the last of which supplies the sensitive nervous fibres of the lungs in the function of respiration, and of the stomach in digestion. All the nerves composed of the two kinds of fibres are known as compound nerves. Examples of entire and almost purely excito-motory nerves are

rare. They are seen in the facial and third pair of cerebral nerves. The purely sensitive are nerves of special sense, and consist of the olfactory, the optic, and auditory nerves, and are given off by the brain. This double order of nerves pervades the entire body, and has brought the physiology of the nervous system within the range of the most exact experiment, and has become the foundation of many important laws, which are as clearly ascertained as any in astronomy. The two orders of nerves, or fibres of compound nerves, never interchange their functions, one of them being always employed in transmitting impressions to the brain and spinal cord and ganglia of the sympathetic nerve, and the other in conveying motor excitements from those centres towards the circumference.

Of the sensitive fibres of the compound nerves there are two kinds, one of which is the medium of transmitted impressions to the brain that give rise to true sensation, or that of which the Mind takes cognizance, and such impressions must be always transmitted to the brain or they will not be *felt*. The purely sensitive nerves are strictly nerves of true sensation. The other kind of sensitive fibres of the compound nerves convey impressions to the medulla oblongata, the spinal cord, and ganglia of the sympathetic nerve which are not *felt*, but produce such effects upon those centres as to give rise to *reflex* actions in other parts through the medium of motor nerves or motor fibres of compound nerves. That kind of sensation I have distinguished from true sensation by the name of *sympathetic* sensation. Of the motor nerves and motor fibres of compound nerves there is but one kind, their office being purely that of exciting motions.

The two great branches of the nervous system (the cerebro-spinal and ganglionic or sympathetic), and both orders of nerves, co-operate together in giving rise to motion in the organs of organic life (or such as are essential to life), so far as organic actions depend upon the nervous system (which only supplies a stimulus), while only the brain and spinal cord and the *excito-motory* nerves are concerned in developing the motions which are brought about by the Mind and the Instinctive Principle, or by mechanical or other direct physical irritations of the brain. In ordinary respiration, for example, the *sensitive* fibres of the pneumogastric nerve (or that which supplies the lungs and the stomach) are in-

dispensable for the transmission of an exciting influence to the medulla oblongata at the base of the brain; but in *voluntary* respiration the pneumogastric nerve is not concerned, but only the brain and the *excito-motory* nerves of the respiratory muscles. In the former case the irritation of the medulla oblongata proceeds from the lungs, and therefore does not originate in the brain or spinal cord; in the latter case the brain is directly irritated by the Will. In the former case, also, a cause *totally distinct*, and originally remote from the brain, makes its impression upon the medulla oblongata of that organ, develops the nervous influence, and calls it into operation upon the respiratory muscles through the same motory nerves as employed by the Will; while in the latter case, or that of *voluntary* respiration, precisely the same nervous influence is brought into action by the Will, and through the same nervous channel, and therefore, by parity of reason, by a CAUSE *as distinct* from the brain as is the cause of the irritation in involuntary respiration. The first is true, also, of all *involuntary* motions when the nervous centres are irritated by impressions propagated upon them from other parts; and the last is true of all *voluntary* motions, and of all the *involuntary*, when the primary exciting cause, of whatever nature, operates immediately upon the centres.

It is also important to understand that my demonstration is concerned particularly with the system of *excito-motory* nerves, both voluntary and involuntary, or those nerves or fibres of compound nerves which transmit influences from the brain towards the circumference, as in voluntary motion, and in the spasms produced by mechanically irritating the nervous centre. These direct transmissions do not involve the agency of the sensitive nerves, but the excito-motory only. Nevertheless, many examples of nervous influence will be introduced in which the other kind, or sensitive nerves, are engaged along with the excito-motory, as contributing to the demonstration. It may be farther explained, too, that when the excito-motory nerves are alone concerned, as in all acts of the Will, or when the Passions operate, or when motions follow in the voluntary or involuntary organs from mechanical or other physical irritations of the brain or other parts of the nervous system, the projection of the nervous influence is in a direct line from the irritated part towards some

part of the circumference, as the voluntary muscles, the heart, &c.; but when both orders of nerves are interested the influences are circuitous—that is, first, from some distant part, through the sensitive nerves, towards the brain, upon which the transmitted influences exert an impression and develop the nervous influence; and secondly, a reflection of this nervous influence through the motory nerves upon the distant parts, and by which they are excited into action. With these last examples, however, I shall be employed only for supplying corresponding illustrations of the more direct proof of the substantive existence and self-acting nature of the Soul and Principle of Instinct as shown by their *direct* action, and that of other causes, through the *excito-motory nerves*, or *excito-motory fibres* of the compound nerves alone.

It may be now said that it is generally allowed that some invisible, intangible principle exists in the nervous system, commonly known as the *nervous power*, but of which I have spoken as the *nervous influence*, to avoid any objection as to the word *power*. Other hypotheses relative to its nature have been more or less in vogue, such as galvanism, a nervous fluid, &c.; but it is conceded by all that some one of them is extensively concerned in the processes of animal organization, and having its origin in the nervous system. I regard it as a power implanted in that system; and have endeavored to show, extensively, in the *Institutes of Medicine*, and in the *Medical and Physiological Commentaries*, that it is a vital agent, which is very variously brought into action either by physical or mental causes, and that when motion is produced by direct or by indirect physical irritation of the brain, or by the Will or the Passions, it is in consequence of the development of this nervous power, and the direction of its influence upon the parts that are brought into motion. It operates equally upon the voluntary and involuntary organs, but through very different nerves, and with very different results in the two cases. It is most important as it relates to the essential organs of life, though its greatest final cause is relative to the non-essential organs, such as the voluntary muscles, and organs of sense. These are the general facts. When the Will produces muscular motion it is by developing the nervous power or the nervous influence, and transmitting it to the voluntary muscles, when it stimulates the muscles, and brings them into action by their own in-

herent properties. And just so of the Passions and of physical causes. There is no wandering of the Will or of the Passions into the organs which they affect, as has been vaguely supposed by such as are not materialists, no more than of physical agents when, on being applied to the nervous centres, they excite analogous motions. But what I have now stated as to the nature of the nervous power, or its mode of development and action, or whether it have any existence, is unimportant to my demonstration. It simply facilitates an understanding of the phenomena upon which the demonstration depends. Equally, also, is it unnecessary to the demonstration that any thing should be known of the special mechanism of the nervous system or of its laws; though an acquaintance with these places the demonstration beyond any obscurity or criticism. All the arguments and conclusions, however, may be allowed to rest upon the facts alone, without reference to their *rationale*. But the foregoing outline of the nervous system will probably be intelligible to all; and there are few, or none, who will not concur in the expression and general import *of nervous influence*.*

Having now stated our anatomical and physiological premises, I shall proceed to the direct demonstration, and endeavor to ren-

* The following remarks in relation to this subject occur in my *Institutes of Medicine*: As the nervous system is carried into all parts of the organization of animals, but has no existence in plants, and since both animals and plants possess organic functions in common, and since, also, the organic functions of animals are variously affected through the instrumentality of the nervous system, not only by causes operating directly upon the nervous centres and the trunks of nerves, but indirectly through the circuitous route of the sensitive and excito-motory systems of nerves, and, especially, farther, since there is no anatomical union whatever between the extreme fibres of the sensitive and motor nerves, nor between them and the fibres or ultimate parts of any other tissue, it follows as a physical necessity that the organic properties and functions can be influenced through the nervous system only by a real substantive agent which is entirely different from the physical structure itself, and which is capable of extending its influences from one tissue to another between which there is no physical union, and that, therefore, all the primary essential impressions must be exerted directly upon the agent itself. Whence, also, it follows that all the results which ensue in other tissues, as consequences of the transmission of the nervous influence from the expanded nerves to those tissues, are due to primary impressions by the nervous power upon the organic properties of such tissues, through the medium of the complex structure. Lastly, it necessarily results, from the foregoing demonstration, that the organic properties appertain just as much to a real substantive agent, known as the Vital Principle, which is as different from the physical structure as the nervous power is different.

der it of easy comprehension to the uninstructed in the physiology of the nervous system, by stating many illustrations derived from the operation of physical causes to serve as parallel examples with those arising from the operation of the Soul and the Instinctive Principle.

We have seen that influences may be transmitted from the brain and spinal cord towards the circumference or distant parts by impressions made directly upon those centres, as when they are irritated by mechanical or other physical agents, or when the Will and Passions operate. We have seen, also, that impressions may be made upon those centres through irritations produced in distant parts, and then reflected from those centres upon other distant parts, and even upon the parts from which the irritation proceeded originally, and excite motions in those distant parts. (This last is called *reflex action* of the nervous system by some, and *remote sympathy* by others.) This transmission of influences from remote parts to the nervous centres, and what is perpetually going forward between those centres and all other parts in natural states of the body, evinces the great and inscrutable susceptibility of the brain and spinal cord, and enables us the better to comprehend the action of an *Immaterial Substance* upon the brain, and its transmission of influences to all parts of the body. An immense proportion of the natural influences upon the great nervous centres (and they are unceasing, and manifold beyond the compass of imagination, and all for the well-being of organic life) proceed from distant parts, and are circuitous in their ultimate destinations. They begin in the expanded extremities of the *sensitive* nerves, or *sensitive fibres* of compound nerves, in all parts, by which they are transmitted to the nervous centres, where they make their wonderful, and, as it were, infinitely complex but unfelt impressions, which are then reflected from those centres upon other parts through *excito-motory* nerves or the *motor fibres* of compound nerves. The palpable exceptions to these reflected influences, and where the transmitted impressions terminate without reflection, are normally confined to the impressions transmitted to the brain from the organs of special sense, as in seeing, smelling, &c., and when no mental emotion is excited by the senses. In all the cases, from whatever parts the impressions upon the brain may be transmitted, a physical cause

operates upon the organ, which produces in one series of the cases movements in distant parts, and in the other series the results of sensation—as seeing, hearing, &c.

The most simple parallel examples between the operations of the Mind (by which I mean both the Soul and Instinctive Principle) and physical agents upon the brain may be seen in the production of motion in the voluntary muscles by the operation of the Will, and by mechanical and other physical irritations of that organ. Spasms and various movements of the voluntary muscles may be produced by the latter causes, and these may be very closely imitated by an act of the Mind. The results from either cause are evidently alike. So also, as exciting causes, are the physical agents which irritate the brain, and thus occasion movements in the muscles, and the Mind, which brings about corresponding movements. The only apparent difference consists in the former being passive agents, brought into operation upon the brain by other causes, while in the case of the Mind that is as palpably a self-acting agent. No demonstration, in all its parallel details, can be clearer or more conclusive.

Unlike the Will, the Passions or Mental Emotions display their effects mostly in the involuntary organs, particularly in the heart, the stomach, and blood-vessels of the face. Here, then, we will have an elementary example parallel with the effects of certain agents of peculiar virtues applied to the brain; such as tobacco, alcohol, &c., which will affect those involuntary parts in a manner corresponding with the results of the mental causes. An infusion of tobacco, or of opium, particularly the former, applied to the brain, immediately lessens the action of the heart after the manner of the depressing Emotions; while alcohol, applied to the brain, exerts the stimulating effect upon the heart of the exciting Emotions. On washing them off, these influences immediately cease, and the heart resumes its wonted action. And here we should not fail to observe the remarkable coincidences between the special virtues of tobacco, alcohol, &c., as denoted by their action upon the heart through the medium of the brain, and the special properties of Fear, Grief, Anger, Love, Joy, &c., as shown by their producing, respectively, exactly the same effects, and thus supplying a very special proof that the Soul is as much a substantive agent as those of a physical nature.

There is a remarkable diversity in the results of physical agents applied to the brain, not only according to the nature of the agent, but the part of the organ to which the application is made. Alcohol, tobacco, and opium affect the action of the heart when applied to any part of the surface of the brain; while in Bernard's experiment, in producing saccharine urine, it was accomplished by pricking the floor of the fourth ventricle between the roots of the pneumogastric and auditory nerves. But more remarkably, in this experiment, the effect upon the kidneys was greatly modified by a little variation of the point of puncture. When the floor of the ventricle was pricked at one place between the origin of the nerves the urine was quickly *increased in quantity*, just as when Fear operates; while a little variation of the place of puncture rendered the urine *small in quantity*, as in the case of Grief. Pricking, and otherwise irritating mechanically other parts of the brain occasion spasms in the voluntary muscles, but only so when certain, though various, portions of the organ are thus irritated. Gall, the phrenologist, says that—"When the brain is irritated by a splinter convulsions are produced, which cease as soon as it is withdrawn." This experiment has been often repeated with similar results; and if some have failed it has been from not pricking or irritating the right parts of the brain. And so will small effusions of blood in the brain produce spasms.

With the foregoing elementary examples of the coincident effects of the Mind and physical causes operating upon the brain, we will come to examples of transmitted and reflected influences, which are very clearly exhibited in respiration, in vomiting, in the contractions of the sphincter muscles, in spasms from teething, or from irritations of the intestines, &c.; all which may be more or less imitated by the Will or by Mental Emotions.

The function of respiration, as we have already seen in part, is carried on through the complex medium of the diaphragm, intercostal muscles, and the pneumogastric, sympathetic, phrenic, and intercostal nerves; the diaphragm being the principal muscle which is moved. The sensitive fibres of the pneumogastric nerve (which originates at the base of the brain), and contributions of similar fibres from the sympathetic nerves, are implanted in the mucous or lining membrane of the lungs, and are the nerves through which an impression, arising from the want of atmospheric air, is

transmitted to the brain, where it develops the nervous influence, which influence is then reflected upon the diaphragm through the motor phrenic nerve which is given off from spinal nerves, and also upon the intercostal muscles through motor fibres of nerves which depart from the spinal cord, by which these several muscles are brought into contraction, the cavity of the chest thus dilated, when the air rushes into the lungs. All these motions depend entirely upon physical causes; and the impression upon the brain as an exciting cause of the nervous influence is the most important element.

Now an act of the Mind, through the medium of the Will, will carry on respiration exactly after the manner of the physical causes, with the only difference that in voluntary respiration the pneumogastric and sympathetic nerves are not concerned, but the nervous influence is excited by the direct irritation of the brain by the Will. The phrenic nerve, as in the case of natural respiration, is the excito-motory nerve through which the Will operates upon the diaphragm in voluntary respiration, and the Will transmits its influence to the intercostal muscles through the same nerves as are concerned in the involuntary act. But the Mind may do more than this. It may completely suspend the operation of the exciting cause proceeding from the lungs, and carry on respiration without its aid for an indefinite time.

No demonstration can be more direct and conclusive than the foregoing. It is absolutely beyond any criticism or cavil, and is alone sufficient to prove the Substantive Existence and Self-acting nature of the Soul; while the same affirmation may be equally made of the immediately preceding. But this is a subject that is entitled to all the overpowering evidence that may be brought in its behalf, that *Materialism* and annihilation may be silenced forever hereafter.

An explanation similar to the foregoing applies to the act of swallowing, though in this case the Will and the physical cause concur together in exciting the muscular movements. Here, as in other analogous cases that will be stated, the muscles which are concerned in the act are lined by sensitive membranes, and are therefore not exposed to the direct stimulus of physical agents, and can be excited to action only by irritation of the sensitive membranes, the transmission of this irritation to the nervous cen-

tres and the propagation of the motor influence from the nervous centres to the muscles—the physiology being so far the same as in involuntary respiration; only, in the latter case the muscles and the part primarily impressed (that is, the lungs) are remote from each other. In deglutition or swallowing, the morsel in the fauces or back part of the throat, and as it traverses the œsophagus or gullet, irritates the sensitive mucous membrane with which the muscles are lined, from whence the impression is transmitted by sensitive nervous fibres to the brain and spinal cord, and then reflected from those centres through motor nervous fibres upon the muscles concerned in swallowing, by which, in part, they are brought into action. But the Mind also co-operates in the act by developing an influence in the brain precisely similar to that which the physical cause has excited, and these two influences harmonize together in consummating the act of swallowing. As in respiration, the Mind may also readily develop all the requisite nervous influence, and perform the act of swallowing without the aid of any physical cause acting upon the lining membrane of the fauces and œsophagus. The same philosophy, as will be seen, applies to the voluntary and involuntary contraction of the sphincter muscles.

We will next consider an elementary example, before reaching the more complex, of parallel effects between the operation of Mental Emotions and certain physical causes. A familiar instance occurs in the coincidences between the effects of an emetic and Disgust, or other Mental Emotion, in producing vomiting. In the case of the emetic, the influence of its irritation of the mucous or lining coat of the stomach is transmitted to the brain and spinal cord through the sensitive fibres of the same pneumogastric nerve as is engaged in respiration, where the nervous influence is developed and reflected upon the abdominal muscles, diaphragm, and muscular coat of the stomach, through motor nervous fibres, by which they are brought into spasmodic action. When the Mind, through the emotion of Disgust, is the exciting cause of vomiting, it develops a nervous influence which is exactly equivalent to that which arises from the action of an emetic. There is, however, one more link in the chain of causation in the former than in the latter case; for when the Mind is the exciting cause the nervous influence is first projected from the brain

through excito-motory nerves upon the mucous coat of the stomach, where it irritates the organ after the manner of an emetic. The influence of that irritation is then reverberated upon the brain through the same nerves as in the case of the emetic, where, as in that case, it develops a nervous influence, as had been done by the mind, and reflects it upon the same muscles with the same spasmodic effect as in the case of the emetic.

When vomiting is produced by *tickling the throat* the Mind has no connection with the effects, but the physiology is so exactly coincident with that which is relative to the Mind, that it goes with the rest, as a clear example in showing how the Mind is necessarily a *substantive self-acting* Agent. The chain of causation is the same here as in the case of the Mind, only the first development of the nervous influence is produced by the transmitted irritation of the throat to the brain and spinal cord. And now observe the exact parallel between the Mind or its emotion of Disgust, and the irritation which proceeds from the throat to the brain, as equivalent causes in bringing the nervous centres into action. The Mental Emotion, as we have seen, develops the nervous influence and projects it upon the mucous coat of the stomach, and the irritation of that membrane thus produced is reverberated upon the brain and results in the sensation of nausea, when, as a consequence of that irritation of the brain by the physical influence proceeding from the stomach, the nervous influence is again developed and reflected upon the muscles concerned in vomiting; while the irritation transmitted from the throat to the brain operates exactly after the manner of the disgusted Mind. Can any thing be plainer to the Understanding?

Whenever vomiting proceeds from disturbance, or disease, or any novel conditions of organs remote from the stomach and brain, the same chain of causation obtains as in irritating the throat; the point of departure being the affected part, and the nerves supplying it are the organs of transmission to the nervous centres. When the irritation in these physical cases is thus made upon the brain, it is exactly equivalent to the mental irritation when the Mind is the exciting cause of vomiting, and the subsequent steps in the process are exactly the same in all the cases. The sickness and vomiting which spring from sailing, whirling, riding, &c., depend upon the same chain of influences.

In these examples the impressions which are transmitted to the brain from remote organs arise from mechanical effects upon those parts; but the same mechanical effect is more or less exerted directly upon the brain itself—often, indeed, more so upon the brain than upon other parts, when its action upon the brain is equivalent to the direct action of Disgust in producing vomiting, according to the preceding examples. The influences upon the brain in these cases arise chiefly from the causes of a mechanical nature; but the Mind often participates in developing the nervous influence through some Emotion that grows out of the physical influences, such as a fearful expectation, &c.; and, as may be further known from another fact which concurs in my demonstration, that a strong determination of the Will to resist *sea-sickness* will often prevent its occurrence, especially the act of vomiting; while, on the other hand, if one has made up his mind to be sick, he will surely be so, though in the midst of a calm. In the latter case the development of the nervous influence by the motion of the vessel falls short of the intensity necessary to vomiting, and the Mental Emotion contributes its part in developing an adequate force; while in the former case the Will keeps down Mental Emotion, and thus deprives the physical influences of a concurring cause that is often necessary to consummate the act of vomiting. Nor will the reader neglect to observe in these examples how the Will has a mastery over the Emotions, and how either, according to its operation, is as much a foreign cause acting upon the brain as are the mechanical—the Mental Emotions rousing the brain to action, or the Will counteracting the emotional tendency of the Mind.

And so of other analogous cases; and so too, when offensive odors, disgusting sights, &c., occasion vomiting through the Mental Emotions which they excite, or as Memory will do the same by calling up a recollection of their former effects. In all such parallel cases with vomiting as produced by an emetic, and in various conditions of disease whose tendency may be to produce vomiting, the Mind, by resolving not to co-operate with the physical causes, or by keeping down fear and other depressing Emotions, may often yield no little protection to the stomach. And it should be duly considered that in this counteracting influence of the Mind, in which the Will is seen not only overpowering the

effects of physical causes but of Mental Emotions, we have, also, another exemplification of its *substantive existence* and *self-acting nature* as contrasted with its co-operation with the same physical causes in other cases. Nothing is wanting but a minute analysis of the facts and their relations to render the question before us as plain as the most tangible objects.

In farther illustration of what has been now said of reflected influences of the nervous system in generating motion, whether occasioned by physical or mental causes, we may consider the very complex example of the motions of the *iris* in *seeing*, which are of an entirely involuntary nature, while the iris stands in the same relation to perfectly distinct sensitive and motor nerves as do the lungs in respiration or the stomach in vomiting. This complexity of nerves for the adjustment of the pupil to the degree of light acting upon the retina or expanded portion of the sensitive nerve in the ball of the eye will be now stated, not only as illustrating what has been already said of physical and mental causes in developing the nervous influence, but to give the reader a farther apprehension, however vague, of the wonderful involutions of the nervous system, instituted for the fulfillment of designs which can not fail of impressing the contemplative mind with reverential awe, and with the deepest conviction that we are "fearfully and wonderfully made." It will also thus become more and more apparent that when such complexities and exact adjustments of the nervous system have been designed, in part, as a medium through which physical causes may operate upon the animal mechanism, it will as clearly follow that the brain and nerves are equally in the same sense *instruments* only of a remote cause when similar results are brought about by the Mind. It is worth premising, also, that although the iris dilates and contracts under the slightest impressions of light transmitted by the nerves, it may be pricked with a knife without exciting contraction.

I proceed, therefore, to say that, in *seeing*, the optic nerve not only conveys the impression of light to the brain which is recognized by the Mind, but it is also the *sensitive* nerve for the iris, by which the pupil is exactly adjusted to the degree of light, while the *excito-motory* nerve of the iris is made up of contributions of nervous fibres from the ciliary branches of the lenticular ganglion and of filaments from the third and fifth pair of cere-

bral nerves, and of filaments from the cervical sympathetic nerve which have their origin in the spinal cord. The brain is the bond of union as in the foregoing cases, and here, as there, the impression produced upon the brain by the action of light develops the nervous influence, which is then reflected upon the iris through its excito-motory nerve, and just according to the degree of this influence the iris contracts or dilates. For an obvious design, the iris, unlike the diaphragm and other muscles in respiration, is withdrawn from the Will; but as the stimulus of light is indispensable to the natural contraction of the iris, and is so far unobserved, it will be readily understood how an impression upon the pneumogastric nerve in the lungs is necessary to the involuntary motions of the respiratory muscles; and since the transmitted impressions to the brain excite no sensation, either in the foregoing cases or in all the endless variety of reflex actions in which physical causes institute the movements, it becomes evident that it is no objection to the supposed action of an immaterial substance upon the brain that it is not felt.

The foregoing anatomical and physiological explanation as to the iris contributes, also, towards an understanding of the elaborate mechanism through which a Mental Emotion operates in producing vomiting, and brings the Mind into the same relation with the brain as a remote exciting cause of the nervous influence that convulses the muscles in vomiting, as light in its development of a nervous influence that occasions the motions of the iris.

With the foregoing physiology of the movements of the iris may be here associated that of *sneezing*, as brought about both by the sun's light and by the associated action of Memory and Reflection. When owing to the direct action of irritants upon the mucous or lining membrane of the nose, such as tobacco, the irritation is made upon the sensitive fibres of a compound nerve distributed from the fifth pair of cerebral nerves upon that membrane, and this irritation, after being transmitted by that nerve to the brain, excites the nervous influence which is reflected upon the respiratory muscles as in the function of respiration; excepting in the former case the muscles are thrown into convulsive action—as we shall soon see may be done by the Mind alone. When the sun's light occasions sneezing, the primary impression is made, as in seeing, upon the *optic* nerve, and through that medium

so irritates the brain as to occasion a development of the nervous influence, which is reflected upon the lining membrane of the nose through the motor fibres of the foregoing branch of the fifth pair of cerebral nerves—just as we have seen of the stomach when vomiting is produced by tickling the throat. The reflected nervous influence upon the nose produces an irritation like that occasioned by snuff, which, as in the case of the snuff (and as in that of the throat and stomach), is transmitted to the brain through the sensitive fibres of the same nerve, where also, as in the case of the snuff, the nervous influence is again developed and reflected with a spasmodic effect upon the respiratory muscles—which consummates the act of sneezing.

Now the Mind will occasion exactly the same paroxysm of sneezing by dwelling intensely upon a former paroxysm, whether produced by snuff or by the sun's light. In this case the Mind develops the nervous influence by its direct action upon the brain (as we have seen of vomiting occasioned by disgust), and this influence is transmitted to the lining membrane of the nose in the same manner as when developed in the case of the sun's light, and the subsequent steps in the process are the same; the rationale being the same throughout as when an emotion of disgust produces vomiting. When, also, irritations of the lining membrane of the nose from any cause occasion a tendency to sneeze but fall short of the full effect, it is a familiar experience that the Mind may readily determine the paroxysm by turning the attention upon the nose, and thus co-operate with the physical cause in developing the requisite nervous influence; just as has been stated of partial sea-sickness.

The olfactory nerve, or nerve of smelling, is only sensitive to odors. The odor of tobacco impresses this nerve, while its irritating effect is exerted upon the foregoing nasal branches of the fifth pair of cerebral nerves. Nor do odors affect the nasal branches, unless they be at the same time of a pungent nature; and then it is the pungency, not the odor, that operates, while the odor is discerned by the olfactory nerve. This pungency may give rise to sneezing, in which the Mind may have no other participation than what has just been stated. But odors may give rise to vomiting, as well as to pleasurable sensations, by impressions alone upon the nerve of smelling, and here the Mind is

alone interested in developing the nervous influence. Even the odor of a rose, although at first pleasurable, is followed immediately in some constitutions by a sense of *Disgust*, so that through the action of this emotion upon the brain a disturbing influence may be transmitted to the heart, or stomach, or even to the intestines. The heart may be thus depressed in its action, the stomach nauseated, and the bowels have been moved by the same cause. Hence the Poet's expression—to "die of a rose in aromatic pain." But there is no other poison than the Mind in the case. It is the Mind that kills, and not the odor; and the Mind is here as much a substantive agent as arsenic in other cases.

Our subject abounds with examples parallel with the foregoing. Sympathetic yawning on seeing another yawn, sympathetic micturition, and sympathetic vomiting are, equally as the foregoing, mental results, and receive the same explanation. Even the *recollection* of any of these occurrences may bring on one or the other, according to the one which may occupy the Mind.

Thus, then, in all the foregoing examples the only apparent difference between the physical and Mental causes, so far as effects are concerned, consists in the *self-acting* nature of the latter. The Mind, the nervous influence, and the physical agents, are all on a par, in principle, as it respects their character of substantive causes in relation to effects, while, also, the Mind in all cases of true Sensation is acted upon through the impressions made upon the brain, and thus itself brought into action. This, however, and whatever I shall have said of the correspondence of mental and physical effects, is only a limited view of their coincidences. The Mind, being connected with the body and acting as the exciting cause of voluntary motion, and taking cognizance of the impressions transmitted to the brain by the organs of sense, should form, also, one of the ordinary stimuli of the involuntary organs, or such as are concerned in the great processes of life. And so we find it, affecting those involuntary organs, through its various Emotions, even after the manner of morbific and curative agents. It has been said—"Cheer up the patient and he is sure to get well," while, on the contrary, a sober countenance of the physician may determine his case fatally. In the *Institutes of Medicine* I have a chapter upon the "Influence of the Mind upon the action of Remedial Agents," in which this subject is variously

exemplified. An Author of the olden times, writing in the palmiest days of ignorance, but not with any reference to our subject but to the cure of diseases, though not of the professional corps, in one of his sallies upon the vagaries of philosophy, let slip a bolt which demolishes every fabric of materialism.

"All the world knows," he says, "there is no virtue in charms; but a strong conceit and opinion alone, which forceth the humors (moral ones), spirits, and blood, which takes away the cause of the malady from the parts affected. The like we may say of our magical effects, superstitious cures, such as are done by mountebanks and wizards. An empyric oftentimes, and a silly chirurgeon, doeth more strange cures than a rational physician. Nymannus gives a reason; because the patient puts his confidence in him, which Avicenna prefers before art and all remedies whatsoever. 'Tis opinion alone, saith Cardan, that makes or mars physicians; and he doeth the best cures, according to Hippocrates, in whom most trust. So diversely doth this phantasie of ours affect, turn, and wind, so imperiously command our bodies, which, as another Proteus, or as a chameleon, can take all shapes, and is of such force, as Facius adds, that it can work upon others as well as ourselves. How can otherwise blear eyes in one man cause the like affection in another? How does one man's yawning make another yawn? One man's p—ing provoke a second many times to p—? Why does scraping of trenchers offend a third, or hacking of files? Why do witches and old women fascinate and bewitch children, but, as Wiarius, Paracelsus, Cardan, Miraldus, Valleviola, Vannius, Campanella, and many philosophers think, the forcible imagination of the one party nerves and alters the spirits of the other? Nay more, these effects of the imagination have led many into the delusion that they can not only cause and cure diseases, maladies, and other infirmities, by this means, as the great physician Avicenna supposeth, in parties remote, but move bodies from their places, cause thunder, lightning, tempests; which opinion Alkiadus, Paracelsus, and some others approve of; so that, I may certainly conclude, this strong *conceit* or *imagination* is *astrum hominis*, and the *rudder* of this our ship, which *reason* should steer, but overborne by phantasie, can not manage, and so suffers itself and this whole vessel of ours to be overruled, and often overturned."—BURTON'S *Anatomy of Melancholy*, 1621.

Before proceeding farther with our demonstration, it is well to keep in view the physiology which connects the manifestations of physical and mental causes acting upon the nervous system. We have seen that the principle is exactly the same, whether impressions made directly upon the brain by mechanical or other physical means give rise to motion in parts that are voluntary or involuntary, or whether the impressions upon the brain be occasioned by influences transmitted to it from remote parts, and which, by reflections of the nervous influence thus excited, equally give rise to motions. In all these cases the resulting motions are involuntary, as in all other cases except such as arise from the action of the Will. But in the case of the *direct* impressions it is particularly important to remember that the motions which are produced by the Passions and other analogous affections of the Mind are essentially involuntary, and, therefore, so far exactly coincident with such as arise from irritating the brain mechanically, or by the application of alcohol, tobacco, &c., and, by my demonstration the same, also, as any reflex movements that arise as the effects of impressions transmitted from distant parts to the great nervous centre.

It is readily seen that a common philosophy must interpret all the foregoing effects. The fundamental cause is the same throughout. It is everywhere the nervous influence; but what strange variety in the remote exciting cause! Let us also observe the parallel which exists between the determination of the nervous influence by the Will upon particular muscles, according to its own choice, and thus constantly passing over, or isolating, all other motor nerves, or yet more remarkably, sending its influences through certain branches of a compound nerve, which is distributed to various parts, and holding in passive subjection all the rest, and the parallel effects of those physical agents which we have seen to extend their influences specifically to the nerves of respiration, as in cases of vomiting produced by physical causes and by Mental Emotions, which avoid all parts but the stomach and certain voluntary muscles, and which, therefore, like the Will, elect and avoid the nerves without reference to their order. This astonishing phenomenon, than which there is nothing in nature more wonderful and paradoxical, or evincing more a most consummate Design, is perpetually in progress in health among all

the organs of life; and when we consider, also, how the well-trained juggler brings into simultaneous action almost every voluntary muscle, and each one in obedience to the foregoing law of elective influence, we shall readily comprehend how physical agents, applied to the brain or to the stomach or the nose, will in the former case affect in a direct manner, and in the latter by reflex nervous action, certain parts only of the complex organism; nor shall we fail of realizing through these coincidences the relation which the Mind bears to the physical causes as a substantive, self-acting, absolute Agent. The same rule, precisely, applies to the various intonations of voice, and to such as form the melody of song, whether in man or birds. Each one, every variation, whatever the succession of change, is determined by an act of volition, rousing and determining the nervous influence, with all the rapidity and mutations of thought, with varying intensity, and incalculable changes of direction, and compounded in an endless manner, upon those muscles which are the immediate instruments of the vocal apparatus. Consider, too, how the Mind is simultaneously employed in analyzing the diverse and complicated parts of elaborate musical compositions, that every minute part may be delivered over to the Will with a precision that shall harmonize with the most delicate instrument of music, and consider, also, how thousands of individuals may concur together with a corresponding harmony; and, while thus contemplating the subject, raise in your own mind the interrogatory—whether it be possible, in conformity with what you know of matter, that all this is elaborated, adjusted, consummated, by a mere organized compound of the elements of matter. And consider, as you ponder upon these things, how exactly the Will graduates the force of every muscle which it brings into action—varying through every imaginable degree from the slightest touch to the death-struggle of the warrior. Observe, also, how the Will may be so roused by the Passions as to determine the most violent and unsteady movements, while at other times it holds the same Passions in subjection.

The Rational Faculties may give such a determination to the Will that the latter may appear to have obtained an ascendency, and to hold the former for hours in some abstract process, or tumultuous passion will settle down into tranquil submission. But

all this involves the simultaneous concurrence, or the primary operation of Judgment and Reflection. All the edicts of criminal legislation, all the Divine Commandments to abstain from evil, are predicated of the influences of this property of the Mind. And so, also, the Will is often concerned along with the Passions in determining the influences through the facial nerve that give rise to all the variety of physiognomic expressions that are incident to the Passions and Mental Emotions, or the Emotion or Passion may alone institute the same, or, more remarkably, the Will alone may imitate all this variety of facial movements and expressions. And here the reader should not neglect the close analogies which we have seen to result from the operation of physical agents applied to the brain, and with all the force of a mathematical demonstration. And yet we shall ultimately see, when I come to the abstract consideration of *materialism*, that all these wonderful phenomena are ascribed, by writers of vast influence, simply, either to molecular chemical forces, or to a combustion of the elements of the brain, or a process of secretion.

Sensation supplies a means of demonstrating the existence of the Soul as a substantive, self-acting Agent. The physical impressions transmitted by the senses to the brain call the Mind into action, and Sensation is the result. This Sensation then becomes a cause of other mental operations through which our knowledge is rapidly multiplied. If, then, in this mode of acquiring knowledge physical impressions upon the brain are necessary to bring the organ into a condition to elaborate ideas, it equally follows that there must be some corresponding exciting cause to originate those actions of the brain which contribute towards those mental processes which are entirely independent of sensation. There must be, I say, a cause as distinct from the brain to bring the organ into action in forming the ideas and acquiring the knowledge which have no connection with the senses, as the physical cause is necessary to the ideas and knowledge which result from sensation. And how does Memory recall these sensations at its pleasure, even years after the original physical causes have ceased to operate? Materialism answers, through pictures of the primary impressions that are indelibly stamped upon the brain. Granting this assumption to be true, there must, of necessity, be SOMETHING to select the precise ones from the

millions of others, and in all their distinct individuality, and render them the subjects of renewed contemplations, and the renewed sources of new ideas and advancing knowledge.

The foregoing relation of Sensation to our demonstration will be farther considered when I come to the special doctrines in materialism. In the mean time, I may not neglect saying that, while the senses, through influences transmitted to the brain, call the Mind into action, they afford another very clear demonstration of an absolute distinction between the brain which receives the impression and *that Something* by which the impression is recognized. It is this: A conflict often arises between the ideas that are excited by the sensitive impression and other ideas which had been antecedently formed, and in entire independence of sensation. The sensation, for example, invites us to some sensual indulgence, but an opposite set of ideas resists the temptation; and this conflict between the ideas of sensation and those which are independent of the senses, are as lasting as the life of man—the triumph of the one illustrating the Godlike endowment of Reason, that of the other the ascendency of animated matter over the Divine attribute of Mind through the intimate relation of the former to the latter.

It appears, from what has been now said, that the coincidences in results of irritations of the brain by mechanical and other physical means with such as follow the action of the Will, Mental Emotions, and Sensations, and the coincidences of these results with such as are brought about by reflex nervous actions arising from irritations transmitted to the brain by parts remote from the organ, and a general concurrence of the coincidences throughout, as to a manifest cause irritating or otherwise exciting the brain, as well as a general coincidence in all the results, form the groundwork of my demonstration.

When speaking of the Passions and Mental Emotions as elements of the Mind, and as producing involuntary effects, I desire to be critically understood that it is not intended to be implied that they are not more or less associated with acts of intellection, and, perhaps, always brought into operation by some act of the Mind properly so called. This is also doubtless true of the Will, which appears to depend more or less upon the previous exercise of reflection, comparison, and judgment, in man, but roused into

action in greater independence in animals—that is, instinctively. This remark may apply also to the Understanding, which belongs to animals as well as to man. If, however, the Passions, Emotions, and the Will be the results of intellectual processes in man, the former, by their great variety and their peculiar operation upon the organs of organic life, while the Will and all the higher Faculties of the Soul are excluded from that department of life, and the sameness of the Will, throughout, in principle and results, evince an individuality that renders them equivalent to elements or properties of the Soul and Instinctive Principle.

So profoundly do the Passions operate upon the heart and stomach that certain philosophers have permitted their imaginations to surmise that they have their origin in those organs; and in a popular sense the heart is considered the *seat of the Passions*, while such is their effect upon the heart the Holy Scriptures speak of that organ, metaphorically, as being the Soul itself. But even the foregoing localization of the Passions could not divest them of an intimate relation to the Mind, which must take the initiatory step of bringing them into action; while others, like Van Helmont, suppose the existence of a *Spiritus Archæus*, an immaterial principle located in the upper orifice of the stomach, to which the work of life is consigned. These opinions, however, are entirely wanting in the necessary facts, and I return to such as are sustained by an endless variety of phenomena; and here we find not only the Soul and Principle of Instinct enthroned upon the great centre of the nervous system, but that the Will and the Passions are as precise and peculiar in their manifestations, and refer themselves as clearly to the Mind as any of its admitted faculties, and their results are far more strongly pronounced. They must, therefore, be taken as equivalents, and as the only philosophical or practical ground of discussion. Indeed, in the progress of our inquiry it will probably become evident to many, if not to all, that the Will is a distinct faculty of the mind.

But the question which is thus raised, in anticipation of any cavilling, has no bearing upon our demonstration. It is equally unimportant whether the Passions and the Will be distinct elements of the Soul and Instinctive Principle, acting independently, or summoned into operation by the higher faculties, or whether they be, respectively, the results of the concurrent action of those fac-

ulties. In the latter case they would be regarded in a collective sense; and as the results are the same as if they were distinct entities, and entirely different from other manifestations of the Mind, they are as properly designated by the specific names of the Passions and Will, and the former resolved into Love, Hatred, Grief, Anger, &c., as any of the Faculties upon which they may be supposed to depend are known by other names. They may be called mere emotions; but still they would belong to mental processes, and that is enough for all the purposes that can bear any relation to physiological inquiries, or to our present objects. It would be, indeed, equally to our purposes were it conceded that the stimulus which gives rise to the Passions emanated from other organs than the brain, since they operate through the medium of the nervous system, are under the control of the Will and Judgment, and are palpably associated with them either as co-ordinate elements or as resulting emotions. They are, therefore, as much dependent upon the brain, and the brain is as necessary to them as it is to the Will and Perception. Any fancied remote stimulus upon that hypothesis would simply rouse the Mind into action, like any remote cause operating upon the organs of sense. The conclusions, therefore, which I shall have predicated of the Passions and Emotions can not be affected by any hypothesis of a metaphysical nature, nor by any supposed involutions of other organs with the brain in the production of their phenomena. Moreover, it may be added, that besides the faculties of Perception, Understanding, and Memory, we meet with little else in the animal tribes but the manifestations of the Will and Passions; and, therefore, in all the animal kingdom, with the exception of man, the mental principle appears to consist mainly of those elements.

Having thus disposed of the foregoing question relative to the Passions to meet the subtleties of the speculative philosopher, I shall now interrogate more particularly the physiological facts as to the individuality of the Will as a property of the Soul and Instinct, when it will be found that it is in no respect the same complex emanation of either as the Passions. It is not obedient to any analogous laws, nor does it operate through the same mechanism as the Passions. It is distinguished from the Passions by the simplicity and precision of its results, by its great final cause,

by its operation upon the organs of animal life, and through the cerebro-spinal system, while the Passions, so far as they affect the organization, operate mostly upon the organs of organic life, and mostly through the sympathetic nerve. In all these respects the Will is on common ground with Judgment and Reflection, while it is the most important and uniform characteristic of the Instinctive Principle throughout the animal tribes.

The Passions, like the Will, exert, also, remarkable influences upon the superior intellectual faculties; and this consideration allies them as closely as the Will with Judgment, Reflection, &c., and, I may add, the Will and the Passions reciprocally influence each other. It is well said by the Rev. Dr. WATTS, in his work on the *Passions*, that—"While we inhabit this sensible world, and are united to flesh, the Passions were given us to assist the feeble influences of our Reason in the practice of duty for our own and our neighbor's good. Reason is too often called away from a due attention to a present necessary idea by many sensible objects; but Passion serves to fix the attention. Reason is too slow, and too weak, to excite a sudden and vigorous activity in many cases; but Passion is sudden and strong for this purpose;" "though it must be confessed, in our fallen and degraded state, the Passions often prove our snares and our torments." He would also "abolish and root out such Passions as Pride, Malice, Envy, and Revenge, as of no use, and never belonged to man in his state of innocence"—which may raise the question whether they were not originally ingrafted upon the Mind, but to be held by the Will in a subdued condition till tempted by the forbidden fruit? Our author goes on to say that—"Fear, Anger, and Sorrow, and some other troublesome Passions, are designed to secure us from evil; while the pleasing affections, such as Hope, and Love, and Joy, may be usefully indulged. This life without them would be a listless dullness and a heavy burden."

From what has been said of the ground of my reasoning, you perceive the consequences which must logically follow. You clearly discern the force of the analogy between the effects of those elements or emanations of the Mind—the Will and the Passions—and of mechanical and other physical causes acting upon the brain. You see distinctly that if the brain be influenced by SOMETHING when *physical agents* acting upon it give

rise, in consequence, to motion in the voluntary muscles, and in the heart, blood-vessels, stomach, &c., so must it be equally influenced by SOMETHING, and *that* SOMETHING must be equally an exciting cause when the Will gives rise to voluntary motion, or when the passions affect the action of the heart, and produce blushing, or pallor, or contortions, or other movements of the face, or excite vomiting, &c. But in all these latter cases *that* SOMETHING must be of a *self-acting* nature, since there is nothing but itself to bring it into action. Or, in the more specific phraseology of the Chemical School of Life, if the mechanical or other physical agents applied to the brain occasion certain physical changes in the organ which are supposed to produce the same phenomena imputed to the independent action of the brain, then, I say, there must be equally a cause for the supposed chemical changes in the latter case, and this cause, according to the evidence of the effects, can be nothing else than a *self-acting* agent, while in either case the assumed physical changes would be merely consequences of the exciting causes.

The only apparent difference, in our comparative observations of the effects of the Mind and of physical agents upon the brain, is that the mind *moves itself*, while the physical causes are brought into action by the motive power of the Mind operating upon the voluntary muscles of the hand that applies them. From the exact identity of effects in the two cases there must be an analogy among their causes and *modus operandi;* and therefore the Soul and Principle of Instinct are as much distinct causes as are the mechanical or other physical agents which determine the corresponding movements.

In instituting parallel examples in the results of the action of the Mind and of physical causes upon the brain, it is evident, from my premises, that if the movements which are excited by the action of the physical causes upon the brain be only remotely due to those causes, and not to any primary, independent molecular changes in the brain, it must equally follow that the effects of the Will in developing voluntary motion, and of the Passions in modifying the action of the heart and blood-vessels and other organs, can not be due to any *original, primary* molecular changes in the brain, as supposed by Materialism, but, of necessity, to some cause as distinct from the brain as are the physical. But

as this is the great point in *materialism*, and forms the chemical and molecular doctrine of intellection, let us admit that the effects brought about in remote organs by physical impressions upon the brain are due to simply some physical change in the organ, and that, therefore, the corresponding manifestations of the Will and the Passions are equally owing to simply physical changes in the great nervous centre, it will still follow just as logically that there must be in the latter case as much an efficient cause for the cerebral changes as there is allowed to be in the former.

So far, then, the analogy is complete. But in the case of the physical agents, they are, as I have said, of a passive nature, and require other agencies to bring them into operation. How different, on the other hand, with the Will and the Passions! Here the causes are entirely *self-acting*, *originating* their own actions in the Sensorium Commune. This, in itself, establishes a radical distinction between the nature of the Soul and Instinctive Principle and of all physical causes, and is utterly fatal to materialism. The *self-acting* nature of the Soul and Instinct transcends greatly the Principle of Organic Life, which requires the operation of stimuli to rouse it and maintain it in action. Nay more, the Will and the Passions are among the most efficient causes in calling into action the Principle of Life, or whatever power the Materialist may prefer as the cause of organic actions; and being in this respect upon common ground with all *vital stimuli*, the Materialist will see in this analogy an insuperable proof of the *substantive existence* and *self-acting* nature of the Soul, and how, also, the same analogy distinguishes the Soul completely from the Principle of Life, or the Materialist's substitute of a correlated external force. The group of facts is here so very comprehensive, and so very demonstrative of the two most important problems in intellectual and organic philosophy, that I shall again return to the subject. (See *Correlation and Conservation of Forces*, Chap. VI.) But I may now say, that, so far as action is immediately concerned in the two cases, an analogy obtains, and we may reason upon that analogy from the *self-acting* Soul to the existence of an active Principle of Life upon which the organic functions depend. But we shall seek in vain, throughout the wide range of nature, for any direct similitude with the manifestations of Reason or of Instinct; though, if we "look through Nature up to Nature's God," we

discover in the results of Creative Energy that analogy with the acts of the Soul which shadows forth the "Image of God."

Let us now summarily review a few of our principal facts which establish the substantive existence and self-acting nature of the Soul and the Principle of Instinct. We have seen an animal whose brain was shocked by a blow or irritated mechanically, and spasms followed in the voluntary muscles; and you see that the Will is even capable of imitating the convulsive affection. Here is another whose brain is irritated by the application of alcohol, and you see the heart beating more actively as an immediate result; and here is a third, whose heart is as quickly enfeebled in action by the application of tobacco to the brain, just as it is excited by joy and anger in the one case, and depressed by grief and fear in the other—and, in either case, as the emotions subside in the one, or as the alcohol or tobacco are washed from the brain in the other, so will the heart speedily resume its wonted action. You also witness the same spasms in the voluntary muscles from the operation of the Passions and Emotions as arise from the mechanical causes when affecting the brain.

But let us rather extend our illustrations by new examples. Consider, for instance, a paroxysm of *Hysteria*, where convulsions of the voluntary muscles are brought on by some *mental* irritation, and where they are exactly the same as when disturbing the brain *mechanically*, or when hysteria arises from irritations transmitted to the brain from distant parts. The Will has mimicked the same results in such perfection as to have often deceived astute physicians. Consider, too, how greatly analogous are these mental displays, whether voluntary or involuntary, to the convulsions that proceed, through reflex nervous actions, from teething and intestinal troubles; and associate with them what we have seen of the exact similitude of the voluntary and involuntary acts of respiration, one of them being determined by the direct action of the Mind upon the brain, and the involuntary act by an impression transmitted from the lungs to the brain—according to explanations already made. How precisely the same, also, the involuntary contraction of the *sphincter ani* and its contraction as effected by the Will, and where the same philosophy applies in respect to causation as in the involuntary and voluntary acts of respiration. That is to say, the sphincter muscle is

held in permanent contraction through an irritation unceasingly transmitted from the part with which the muscle is associated to the spinal cord, and the nervous influence thus excited and reflected upon the muscle, while the Mind may at its pleasure increase the contraction. The example is very direct and emphatic in establishing as clearly a remote cause (the Will) of the action of the brain upon the muscle in the voluntary act, as of the spinal cord in the involuntary (the irritation transmitted to the cord)—since, if such a cause be necessary in the latter case, it must be equally so in the former. Consider, also, among the inexhaustible examples, the analogous effects which result from the operation of an emetic and a blow upon the head, the vomiting produced by either cause being the result, as hitherto explained, of an irritation of the brain, and you witness precisely the same effect from *Disgust*, and even from its *recollection*. But vomiting is not the only coincidence between the physical and mental causes. We often see them simultaneously with the vomiting, and through the same nervous influences, bathing the whole surface with perspiration; pouring the saliva from the mouth; breaking down a tumultuous excitement of the heart and arteries, besides other effects which it would be superfluous to mention; and compare many of these results with the effects of Fear—the bounding action of the heart, the small and rapid pulse, the half-suspended respiration, the pallor of the skin and the copious perspiration, the flood of urine, the hurried movements of the intestine, the ghastly countenance and the frightful eyeballs, the trembling of the voluntary muscles and the prostration of their power;—or, compare the results of many physical causes, such as constipation of the bowels, with the effects of Grief, either of them so influencing the brain as to undermine digestion, or so acting upon the brain as to overthrow the mental faculties;—or, consider how Hope, succeeding to Grief, will, like tonics, cathartics, shower-bath, change of air, &c., influence the nervous centres in yet other ways, so as to restore that digestion which Grief had impaired. And what makes the tears flow, when Grief, or Love, or Joy, or Anger, is in the ascendant, just as they do when snuff or other physical agents irritate the nose? Why does "the mouth water" at the sight of a bountiful feast, or on scenting its odor, or from the clattering of dishes, or from

its *expectation* alone, just as it will on chewing horse-radish or tobacco? Why will offensive odors, or startling, or other offensive sounds, so affect the Mind as to operate upon some after the manner of cathartics? And, as affirmed by Shakspeare—

> ——"Others, when the bagpipe sings in the nose,
> Can not contain their urine for affection.
> Masterless Passion sways it in the mood
> Of what it likes or loathes."

The philosophy of this is analogous to what I have said of the physiology of light in producing *sneezing;* with the exception that, in the case of the bagpipe, an emotion of the Mind co-operates with the sound in developing the nervous influence; while in that of the light in sneezing, if it fall short of the effect, the Mind, by reflecting upon the irritation of the nose, may determine the paroxysm by its deliberate action, or may reproduce it, as we have seen, without the aid of any physical cause. And farther as to offensive sounds, it is related by Dr. Fairfax, that—"Mistress Raymond, whenever she hears it thunder, even afar off, begins to have a bodily distemper seize her. She grows faint, sick in her stomach, and ready to vomit. At the very coming over of the thunder, she falls into a downright cholera, and continues under a violent vomiting and purging as long as the tempest lasts. And thus hath it been with this gentlewoman from a girl."—Now the foregoing diuretics, emetics, and cathartics are Mental Emotions, and have their analogies in the shops of the Apothecary. Again, *cold*, suddenly applied to the surface of the body, is often a powerful diuretic, and, like the warm bath also, may as suddenly determine micturition as an act of the Will. The former phenomenon is the result of a complex process of reflected nervous influences, while, as always, the Will operates in a direct manner. Moreover, in conjunction with the Will in determining micturition is the excreted fluid, whose irritation of the mucous coat of the bladder is transmitted to the brain, where it excites the Will into deliberate action, and co-operates with it in developing a nervous influence that is then projected upon the muscular coat of the organ and brings it into contraction; which is equally true of all animals as of man. That same irritation of the mucous coat of the bladder also maintains the convergent fibres of the muscular coat, which form the sphincter, in a state

of permanent contraction by an unceasing determination of the nervous influence upon them—just as we have seen of the sphincter ani. The contents of the organs in one case excite the nervous influence, and the Mind in the other. Analogous examples, as already stated, occur in voluntary and involuntary respiration, swallowing, &c. It is also worth stating as a critical fact, that the Mind may hold in contraction either of these sphincter muscles, in opposition to violent irritations that may call for relief.

Again, there is nothing more uniformly and powerfully diuretic than Fear, being, also, in its excessive operation, like emetics, &c., a powerful sudorific. Consider, also, a modification of Fear as showing the delicate shades of difference among the Passions, and how they correspond in their effect with those of physical agents. Thus *Anxiety*, which has *fear* for one of its elements, exerts also a like but modified effect. So, also, *Jealousy*, which results from the united operation of *fear* and *love*—as well expressed by Sappho—

> "In dewy drops my limbs were chilled,
> My blood with gentle horrors thrilled,
> My feeble pulse forgot to play,
> I fainted, sunk, and died away."

And coming to the pure element, Love itself, we observe other coincidences with Fear, and with the effects of the physical agents, with which those of Fear coincide, especially as it respects perspiration, and certain modifications of the heart's action, and of the respiratory movements.

It is said by Rev. Dr. Watts, that—"In many of the Passions the sensations and motions of the Mind are so exceeding swift and momentaneous, they become so joined and complicated with each other, and they run so often into one another in an *undistinguished mixture*, that it is exceeding hard to give such an accurate and distinct account of the effects of all of them as one would desire." In these complicated cases, movements are roused in rapid succession throughout the voluntary and involuntary organs, and various physical products are also the resulting consequences—such as a flow of sweat, of saliva, of bile, of tears, of water, of mucus, &c., just as arise from "undistinguished mixtures" of active medicines.

In all the foregoing comparative examples it is palpable enough that, in one series of the cases the effects are owing to some physical cause irritating the brain and spinal cord, and which is totally distinct and different from those nervous centres; and can any one be so regardless of the plainest rule of philosophy as to suppose that the corresponding results in the other series are not equally due to some cause which is alike distinct and different from those nervous centres? All of them are the most familiar facts that engage our attention; but such as are relative to the Mind have engaged us only as facts.

I now return to my statement relative to the nervous influence in pursuit of a common exciting cause by which all the endless but analogous phenomena to which I have adverted are brought about. It is readily granted that the mechanical and other physical causes applied to the brain are not transmitted to the remote parts which they influence through the medium of the nerves, and we must therefore look for some *intermediate* cause by which the remote effects are produced. It is of no importance to our present object whether this cause be galvanism, or a nervous fluid, or nervous power, or a vibration of the nervous fibres, &c.; and from the analogy between the effects of the Will and the Passions, and those of the physical agents, it is equally clear that those attributes of the Mind are not transmitted to the parts affected, but that they must operate through the same intermediate exciting cause as the physical agents. These unquestionable coincidences, therefore, not only place the external and internal primary causes upon common ground as substantive agents, but are demonstrative of their operations through some common cause appertaining to the nervous system. This is also farther sustained by the simplicity and consistency of Nature in her fundamental institutions; especially where the mechanism is the same, although there be great diversity in the remote causes and results.

Here I might bring my direct demonstration to a close as it respects the *substantive existence* of the Soul, and its power of *instituting actions* in connection with the subordinate material fabric. But there may be some who may be inclined to follow me in a more extended inquiry, especially as the demonstration will continue to be predicated of admitted facts and principles.

The variety of physiological exemplifications is far from being exhausted, and the plainest examples will be selected, that they may readily concur with the foregoing in enforcing the conclusions at which we have already arrived. Among them some of the most obvious relate to the respiratory muscles, which, as we have seen, are both voluntary and involuntary. Besides the diaphragm and intercostal muscles, those of the face belong to this series, although they do not participate in the ordinary acts of respiration. They are mostly subject to the action of the Will and Passions, while, as we have seen, the diaphragm and intercostal muscles are brought into motion by a remote physical cause in ordinary respiration, though the Will may occasion exactly the same movements, and, indeed, often co-operates with the physical cause in their natural function. But the muscles of the face are brought into action by the same remote physical cause as excites the diaphragm and intercostals in several modifications of respiration; some of which are natural, as in sneezing, coughing, yawning, laughing, and others more or less morbid, as asthma, hiccough, &c. In all but two of these cases (yawning and involuntary laughing), the movements depend upon the excitement of the nervous influence through some sensitive nerve (generally the sensitive fibres of the pneumogastric nerve, as already explained), and the reflection of that influence from the brain and spinal cord, through motor nerves, upon a part of, or upon the whole of, the respiratory muscles. In each modified process there is a special irritation of the nervous centres by the transmitted remote cause, and in each the nervous influence (or immediate exciting cause) is brought into operation by the transmitted remote cause in a peculiar manner, and according to that manner is the nature of the movement. In *Asthma* a stronger irritation is transmitted from the lungs to the brain, and a more intense motor excitement is reflected from that organ upon the muscles of respiration (often including those of the face) than in ordinary breathing, and not unfrequently the Will comes to the aid of the irritation propagated to the brain from the lungs. Here, then, it is seen that the prompting of the Mind and the physical cause are brought naturally into immediate co-operation in rousing the action of the brain. The physical cause is insufficient for the development of that nervous influence which is necessary to

excite the requisite movements of the respiratory muscles, and therefore compels the Mind to lend its assistance. Both act in perfect harmony together; nor can any difference be observed in the results of either (which, as we have seen, is also true of involuntary and voluntary respiration), excepting as the Mind acts with greater energy in asthma than the remote physical cause, and brings the respiratory muscles of the face into action.

Now, upon the physical hypothesis of the mental functions, what is it that superadds to the respiratory movements, in the foregoing case, a cause perfectly distinct from such as naturally governs the process? If it be said fluctuating conditions of the brain, what is the *cause* of those fluctuations? Why, in the superadded voluntary effects, is there at one moment only a moderate degree of the supposed chemical or secretory process in the brain, and at the next a greatly increased amount of one or the other, and this requiring as much a *cause* as the excitement of the brain in the ordinary involuntary act? And here I may again advert to the sphincter muscles as supplying a parallel example. *Consciousness* also decides the question in all the cases.

Take another illustration—the acts of voluntary and involuntary *laughing*. When the feet or arm-pits are tickled, laughing follows irresistibly in many, as the effect of an irritation transmitted to the nervous centres by sensitive nerves supplying the skin of these parts. The phenomena are the same as witnessed in ordinary laughing when the Will and agreeable Emotions are the exciting causes. Here are three distinct cases as it respects the nature of the exciting causes; in one of which the Will may produce the phenomenon independently of an Emotion, or an Emotion may do the same in defiance of the Will, or the physical cause of itself alone and in spite of the Will. In the last case the sensation soon becomes painful, and then goes on in direct opposition to the Will. A man, for example, bound the limbs of his wife, and tickled her feet till she died of laughing, just as some die suddenly of a strong mental Emotion, "which," as Shakspeare says, "is as bad as to die with tickling." And here I would ask the Materialist what other construction he can apply to the cases of sudden death from *Joy* and *Anger* than the powerful operation of some unseen cause upon the brain, and

through that organ upon the organs of organic life? What other condition than a violent shock of the brain from a cause as *distinct* in its nature from the organ as the *hammer* whose blow upon the head is fatal through *precisely the same physiological influences?* The *blow*, also, upon the region of the *stomach*, and *surgical operations*, which have destroyed life on the instant, operate in the same way as the paroxysms of Anger or of Joy, which have been as suddenly fatal; only in the former cases the primary effects of the remote causes are transmitted to the brain from the injured parts, when they develop the same fatal nervous influence as is produced by the direct operation of the Passions.

A case precisely parallel in its physiological rationale with death from Mental Emotions occurs in *Syncope*, when it arises from seeing or hearing something offensive. Here the immediate cause, as in the case of death from Joy or Anger, is the instant and powerful determination of the nervous influence upon the brain, heart, stomach, &c. But there must be SOMETHING *to develop* that nervous influence in the brain, and the common sense of every one, even of the *Materialist*, assures him that it is a *conscious*, *self-acting* agent that does the work. But for a farther illustration of this subject, and to appreciate as well as we may the physiological relations of the Mind to the body in some of the minutest, involved, and wonderful details, let us revert to the physiological rationale of syncope, vomiting, &c., as produced by offensive sights, odors, and sounds, and by a recollection of their effects; and analogous facts in relation to sea-sickness, &c., and many other parallel examples hitherto presented. And let us connect with the foregoing facts the syncope and vomiting which follow blows upon the head, and it will be seen, as plainly as we see that the physical blow upon the head is the cause in one case, that the Mind inflicts the blow in the remaining series, or that of joy, anger, offensive sights, odors, &c. The physiological effects prove conclusively, both in their nature and coincidence, that one cause is as much *an agent* acting upon the brain as the other, and that both are equally distinct from the organ. In all the cases where the physiological effects are consequent upon mental processes, the Mind and the effects stand in the same relation as do the physical causes and their effects in the other cases, and where, also, the effects are precisely the same in both

series. To suppose the absence of an exciting cause acting upon the brain in the former series is a physiological absurdity, and to suppose any other primary cause than the Mind, or a *Self-acting Agent*, is a greater absurdity; nor have I any doubt that the Materialist will finally come to this conclusion. Nay, more, the Mind, the brain, and cerebro-spinal nerves are absolutely necessary to all voluntary movements, as the brain is to all sensation and ideas; while the motions of the involuntary organs may go on with the aid only of the sympathetic nerves, as shown in monsters born without brain or spinal cord. Does not this, in itself, evince a cause appertaining to the brain for the fulfillment of those great purposes of life which distinguish man and animals from plants, while no such cause is necessary to the organs which are designed merely for the support of the intellectual mechanism? If, also, the brain alone were the cause of voluntary motion, why should not the heart, the stomach, and other involuntary organs be liable to such movements? Why should there be any discrimination as to what muscles are moved, unless directed by something different from the common medium through which the voluntary motions are effected, and with all the precision in the multifarious details of which I have hitherto spoken?

Again, in respect to offensive odors when they produce vomiting or syncope, the stomach being especially affected in the former case, and the heart in the latter; in the former the Mind may be more interested in the physiological effects than in the case of *syncope* from analogous odors, since the odors may be so far different in the two series that *Disgust* is in operation in one, but not in the other. A rose may occasion syncope when just plucked from the bush, but vomiting only when in a decaying state (page 52). The Mind, therefore, in the case of vomiting, is tributary, along with the physical cause, to the development of a nervous influence which is projected with a nauseating effect upon the stomach, just as we have seen of sea-sickness, &c. (page 48). But, as has been stated, the Mind, by meditating upon the former effects of a disgusting odor, may alone produce vomiting or syncope. Sympathetic vomiting, on seeing or hearing another vomit, is mostly of this nature; but here, too, as in the case of the odor, the Mind alone may determine an act of

vomiting by simply reflecting upon a disgusting spectacle that had upset the stomach; nor should we here neglect a reference to the parallel effect of emetics and blows upon the head.—But in the case of syncope as produced by odors, a different Emotion is brought into operation, which determines the nervous influence with a depressing effect upon the heart, as when an infusion of tobacco is applied to the brain, and syncope follows. On the other hand, if the odor be of an agreeable nature, *Joy* is the result, and this emotion occasions an excitement of the heart, as when alcohol is applied to the brain or ammonia to the nose.

I have spoken of the physiology of *involuntary laughing*, in which the Mind has no participation, but where an irritation is transmitted to the brain from some remote part as the exciting cause of the nervous influence (page 69); and we may now look at the physiology of *voluntary* laughing, in which the Mind rouses the brain without the intervention of any other cause, and determines the nervous influence directly upon the muscles of the face, just as upon all the respiratory muscles in voluntary breathing (page 45); and which is also true of a Mental Emotion and the blood-vessels of the face in blushing, and of the production of tears in weeping.

And so, also, of *voluntary yawning;* but in the ordinary or *involuntary* act, which is really a modified form of breathing, the Mind may have but little or no participation, but it may depend alone upon a physical impression transmitted from the lungs to the brain (page 68) along, perhaps, with a concurring sense of uneasiness propagated to the brain from the voluntary muscles; or, if the Mind participate, as in its efforts to relieve a sense of weariness, the physical and mental causes act in co-operation, just as happens in severe cases of asthma (page 68). At other times a very different chain of causation may be observed, and where, also, the mental and physical causes appear to identify themselves with each other, as in *sympathetic* yawning, where one yawns on seeing another yawn, or in talking about it; for in one case an irritation is propagated both to the brain and Mind through the nerve of vision, and in the other through the auditory nerve, and simultaneously the Mind conspires with the physical irritation in exciting the nervous influence and directing it upon the muscles of respiration. But a paroxysm of yawning

may be readily consequent upon simply *thinking* about it, as may be the case with many on reading this statement; when the reader will, doubtless, feel quite assured that his Mind, or something distinct from the brain, is as exclusively the remote exciting cause of the brain in this instance as the physical irritation of the organ commonly is in ordinary or involuntary yawning. Other illustrations to which the same explanation is applicable have been presented.

What we have hitherto considered are plain examples among a multitude of analogous ones. But we must consider others less obvious, that Materialism may not oppose us with specious problems in organic philosophy. It may be asked, for instance, "How will you explain the movement of the limbs during sleep, upon your doctrine?" The ready answer is, exactly upon that doctrine, since the facts are of the same nature with those already stated. In these cases the act may be either voluntary or involuntary, or a union of both; but throughout it arises from some impression made upon the nervous centres. Sleep may not be so profound as to suspend entirely the action of the Will; or, in other cases the motion is owing, remotely, to some impression transmitted from the limbs to the nervous centres. Those remote impressions arise from some constrained position, or analogous cause, and may not awaken perception, or call the Will into exercise; though, doubtless, in most cases the Will is roused into action. If involuntary, the phenomenon is then coincident, both as to cause and effect, with the motions of decapitated animals, as when, for example, a decapitated turtle draws up its leg on being pricked, or as a bird flutters and runs on striking off its head. Here there is no sensation, no Mind in operation, and the nervous influence proceeds, of course, from the spinal cord alone; and the example is another clear illustration of the *substantive, self-acting* nature of the Mind.

Let us now suppose that the Materialist will demand of us an explanation, upon our general facts, of the influences which are concerned in sleeping in the erect posture, which is common to many animals. The physiology of voluntary and involuntary respiration, and particularly the action of the constrictor muscles, and the exact coincidences between the voluntary and involuntary acts in either case, supply, respectively, an answer to the in-

terrogatory (page 44). It is evident, therefore, that, in sleeping in the erect posture, the muscles of the limbs are placed by the Will in a state of *tension*, the influence of which is constantly transmitted to the nervous centres, where it as unceasingly excites a nervous influence after the action of the Mind is suspended, and which is reflected upon the muscles of the limbs with the same rigid effect as had been instituted by the Will, and in a manner similar to that which holds the sphincter muscles in a state of permanent contraction (pages 63, 66).

The foregoing explanation is alike applicable to both the contracted and the extended leg of the bird in roosting. The whole principle, in all its variety of manifestations, according to the nature of the animal and the uses of parts, has its foundation in consummate Design. The modifications in different species of animals correspond with those of Instinct, and are full of instruction to the contemplative mind. Their final cause belongs to the same inscrutable system of Designs as the varieties in Instinct itself; and if we may not trace out the exact mechanism, or the remote causes, in all the cases, there are a multitude of analogous facts which have been clearly ascertained, and which as clearly interpret the less demonstrable problems to every right-thinking mind. The route of the nervous influence among the organic viscera, and even among the voluntary muscles, is often eluding the knife of the anatomist; and well may he sometimes despair of success, yet rest in the conviction that Nature operates by general laws, when he considers the fact that the Will determines its influences upon whatever voluntary muscle it chooses, passing over many intermediate nerves, or electing one only, and far removed from its own seat of operations. And so shall he equally find it in organic life, where the Passions play their part, at one moment upon the heart, at another upon the skin or kidneys, or raise the blush of modesty in the blood-vessels of the face, or strike us dead in an instant.

The foregoing instance of sleeping in the erect posture is one of the rare exceptions to the institution by the Will of reflex actions, or in which an involuntary nervous influence is established by the Will and brings the strictly voluntary muscles into contraction; and it forms a very critical proof that a self-acting agent is as much the cause of the voluntary act as a

physical cause necessarily is of the involuntary. Very similar to that are the spasmodic affections (particularly of the muscles of the lower extremities when rendered susceptible by disorders of the digestive organs) which arise from extending or "stretching the limbs," when in a recumbent posture. In these cases the Will is manifestly as much an originating cause of the nervous influence that brings the muscles into voluntary action, and as distinct from the brain, as that subsequent reflected impression upon the brain which determines the nervous influence upon the same muscles in an involuntary manner.

If we now inquire into the remote and physiological causes of *Sleep*, it will be seen that the Mind, through its property the Will, has often more influence as a remote cause than any of a physical nature, and that the physiological condition of the brain, as the immediate antecedent of sleep, which is induced by the remote causes, whether physical or mental, can be only imperfectly understood; although it consists essentially of *some modifications of its relations to the Mind* by which its co-operation with the *self-acting* agent is suspended, and thus places that Agent in a passive or dormant condition; when the brain, being no longer excited by its associate Principle, not only recovers its normal state, but in failing, through its quiescence, to act upon the voluntary muscles, the entire body enjoys the same restoration. It should be observed, however, that it is a great mistake of *Materialism* to suppose that the organs of organic life are "exhausted," or even impaired in their wonted vigor of action, by the usual wakefulness and labor of the day. The exhausting influences fall upon the organs of animal life—the voluntary muscles, the senses, and the cerebro-spinal system; though, when wakefulness is long protracted, an injurious influence will be more or less exerted upon the great vital organs, especially those of digestion, and this greatly through the depressing effects of the wearied Mind. But were there any foundation for Materialism, then should the great organs of life suffer from ordinary wakefulness in common with those of the animal group; for then should the influences of the brain be felt alike throughout the body—and this goes with the rest in proving that it is something besides mere brain that wearies the animal organs.

Different hypotheses have been offered in explanation of the

Physiology of Sleep; but none of them includes the Mind as a remote cause of the supposed condition of the brain. The opinion which has most commonly obtained among physiologists, and one of the oldest, supposes that a turgescence or distension of the blood-vessels of the brain and their consequent pressure upon the organ is the cause of sleep.* But more recently an exactly opposite doctrine has appeared, which refers sleep to a diminution of blood in the brain as the immediate cause, and a loss of material sustained by the brain and all other organs during the active condition of the Mind as the remote cause; though the doctrine supposes, also, that any other remote cause which may lessen the quantity of blood in the brain may induce sleep.

However much certain modifications of the physiological condition of the brain may be necessary to sleep, it is not less certain that sleep may be induced by a variety of remote causes which have no relation to the supposed wasting of the tissues of the body as a remote cause. The Mind itself is constantly tributary to the production of ordinary sleep. It is through this influence of the Mind, also, either in its independent agency in inducing sleep, like remote physical causes, or in its co-operation with those causes, that we obtain another demonstration of the *substantive existence* and *self-acting* nature of the Soul and the Principle of Instinct.

Let us look, in the first place, at the Mind as a concurring cause of sleep when not the inevitable consequence of protracted wakefulness or of bodily fatigue. As ordinarily obtained, it is a matter of familiar experience that immediately before laying the head upon the pillow there is no apparent tendency to sleep; but as soon as the recumbent posture is taken sleep may follow on the instant, although that very position increases the volume of blood in the vessels of the brain. What, then, is the immediate cause of this sudden transition? Certainly not a diminution of blood in the brain, or other physical causes alone, for they had

* Dr. HARTLEY employs his celebrated doctrine of nervous vibrations (of which more will be said hereafter) in interpreting the philosophy of sleep, as also dreams, &c.; and here we meet, as an important element, with compression of the brain by *distension of its veins*, which is supposed to arrest the nervous vibrations or oscillations; though he allows that the accumulation of blood takes place during sleep, and of course, therefore, is not a *cause but a consequence.*

manifested no such influences before the Will had determined upon sleep. But it is manifest that some cause of very decided and rapid action has contributed powerfully to the result—apparently not unlike the blow upon the head, or the respiration of ether, which suddenly occasions stupefaction. What cause, then, so obvious as that *self-acting* one which had suddenly determined upon sleep? This, therefore, is the philosophy of the subject. As soon as the recumbent posture is taken, the Will brings itself into decisive exercise, withdraws its action from the voluntary muscles and senses, and, above all, lays a restraint upon all the other intellectual functions, or, in popular phrase, "calls in the wandering thoughts," subdues the agitating passions, and then, in great consistency, leaves them at rest. The physical condition of the brain and of the senses and voluntary muscles, induced by other causes, often greatly facilitates these achievements of the Will; or, after long wakefulness or great bodily fatigue, the physical causes alone may bring on sleep, and that, too, in spite of the Will to the contrary. So powerful, indeed, is the Will in its tendency to maintain the brain in the condition necessary to wakefulness, and such are the frequent motives for its unceasing and energetic action, it would have been a fatal defect in design had not the brain been so constituted that other causes should render it obtuse to the action of such a restless element of the Mind whenever demanded by the exigencies of the body.

But again, when the Will is not prompted to action by other mental elements, or by sensation, &c., it assumes a passive condition as it respects the body; and then there may be no necessary agency of physical causes, external or internal, in the production of sleep, but the unaided Will may bring about the result. This is also a common experience; for who has not nodded his head under an act of volition, for the simple purpose, perhaps, of "whiling away time," or for gaining time in anticipation of a night's watching? Having no other occupation, so quickly and powerfully operative is the Will in this respect, that it may bring about sleep with great instantaneousness.

Again, there are certain external physical causes whose tributary influences in producing sleep are scarcely appreciable—such as the bubbling of a stream, lullaby music, rocking the cradle,

combing the hair, &c. In these cases the physical influences transmitted through the nerves to the brain make a direct impression upon the organ that immediately predisposes to sleep; but the very slight impression is mostly instrumental in calming the Mind, and thus arresting its exciting action upon the brain. This rationale applies, also, to the drowsiness incident upon dull reading, "dull sermons," proverbially, and even reading upon solemn subjects that completely engross the Mind, when attention languishes in the one case, and does not return to other subjects in the other; and thus the Mind soon ceases its actions upon the brain, and sleep follows as a consequence.

The part, therefore, which the Mind takes in producing sleep, or in contributing with other causes, devolves upon the Will, which operates by holding other properties of the Mind in subjection and ceasing its own influences upon the body; while the concurring external physical causes, of whatever nature, divert the Mind from its wonted operations, and also reduce the irritability of the brain, and thus lessen or arrest altogether the action of the Mind upon its organ. It is in this latter way that soporifics, such as opium, &c., taken in moderation by the stomach, bring on sleep.

Thus the Mind being put at rest, it becomes almost a logical consequence of the inaction of a cause of such unceasing and powerful operation upon the brain in its waking hours, that the circulating mass of blood within the organ should undergo diminution; and hence it is equally as logical that the diminished circulation is the *consequence*, and not, as has been supposed, the *cause* of the cessation of mental action, however much it may subsequently contribute to the dormant state. Indeed, the most unfavorable position for a diminution of blood in the brain is the horizontal posture; and there can be no doubt that there is an increased determination of blood to the brain on assuming that position; and it is for this reason that the most efficient means of removing syncope incident upon the abstraction of blood is that of laying the body horizontally.

Now all this relative to sleep has its deep foundation in Design; so indispensable is sleep to the general economy of the entire mechanism of man and animals; though the Will has a much greater agency in its production in the former than in the latter,

on account of the differences in their mental constitution and the resulting influences upon the brain and general organism of one or the other, and which will be rendered more intelligible when I come to the consideration of those differences under the subject of Instinct. There is often in man a profound involution of causes; but in no respect, as it relates to man, is Design so manifest and sublime, in the physiology of sleep, as in rendering the Will tributary, in a variety of ways, to that rest which it is mainly instrumental in suspending.

Of an analogous import to the physiology of sleep is the subsidence of suffering, both bodily and mental, under certain impressions made upon the brain, either by the Passions alone or in connection with the Will. Thus many will revert to their sudden relief from the toothache on learning the near approach of the dentist. Fear of the wrenching instrument has dissipated all pain almost on the instant. If, therefore, a physical cause acting upon the brain was necessary to the suffering, it must equally follow that some counteracting cause operating upon the organ was necessary to the relief. Analogous cases, in which Fear and other Mental Emotions are interested, have been already presented, and others will readily suggest themselves. Of a somewhat different nature is the effect of "Perkin's tractors," amulets, the impostures of animal magnetism, clairvoyance, &c., which exert their effects in relieving pain or disease, through the Imagination and Hope, and are therefore inoperative upon animals (see page 53). It is obvious enough, also, that Despair, Grief, Jealousy, are removed by the ascendant influence of Hope and the Imagination; which, when considered in connection with our parallel examples of physical and mental causes, shows us that these conditions of the Mind not only possess an individuality, but are operating causes.

There remains now to be considered, in connection with the foregoing, the demonstrative proof of a Soul to be derived from human designs. We, therefore, depart for the present from our physiological ground. The proof from Design requires no elaborate discussion, for a single example as simple as the pendulum of a clock, which associates itself with the Creator's Design of gravitation, comprehends the whole philosophy. I would commend this subject particularly to those who are incapable of ap-

preciating the necessity of a self-acting, originating cause in the inception of ideas, a cause wholly different in its nature from the organized conditions of matter. All human designs invariably ally themselves, in respect to their origin and mental execution, with the Designs of the Creator, and establish the certainty that the former originate in a self-acting, designing Cause precisely analogous to that of the Author of nature, and that if one be material or the result of matter, so also must be the other. As the premises are alike, the argument and conclusions must be the same in both cases. Those who subscribe to the materiality of the Creator necessarily suppose that matter is self-existent, which is equivalent to the rejection of such a Being. And, again, if it be admitted that the Creator has communicated with man, the conclusion is inevitable, that it is through the same intellectual medium that man is enabled to understand the communication, or that they have conferred with each other.

Although the cultivators of the so-called "New Sciences"—the "*Correlation or Equivalence and Conservation of Forces*," *Darwinism*, &c.—find it for their interest to deride *final causes*, and *evidences of Design*, and *Natural Religion*, it nevertheless remains as true as ever that there are "sermons even in stones." Without this means of attaining a knowledge of the Supreme Being there would scarcely have existed among the heathen Philosophers a system of Theology far transcending that of the Materialists who live under the Christian Dispensation—nay, nothing of their earnest belief in a Soul and its immortality; however much it may have been prompted by a consciousness of higher destinies, or a loathing of annihilation, which pervades the masses of the heathen world. Well, therefore, may the Materialist rejoice in his new-born doctrine of the *Correlation or Equivalence and Conservation of Forces*, and protest against "Natural Religion" and "Final Causes." But I would commend to his attention the opinion of Lord BOLINGBROKE, whose works were indicted by a Grand Jury as undermining Religion and morality. He may thus appreciate, at least, the toleration of his own times; for this condemned Philosopher administers to the Materialist a lesson on the subject of Natural Religion after the following manner:

"Natural Religion is that *original Revelation* which God has made of Himself, and of His Will to all Mankind, in the consti-

tution of things, and in the order of His Providence. Whatever is there revealed is within the reach of our faculties; and the same reason which He has given us to improve the physical, He has given to improve the moral system of our lives." "What we see of Him within the extent of our horizon we see clearly." Let us be just to Lord Bolingbroke!

But perhaps you answer that Bolingbroke was "a condemned criminal," and therefore an unreliable witness in behalf of his own innocence. Take, then, the infallible testimony of the greatest Physicist, of whom it is said that—

> "Nature and all her works lay hid in night,
> God said—'Let NEWTON be!' and all was light."

And NEWTON responded—"De Deo ex phænomenis disserere ad philosophiam naturalem pertinet." Literally translated—"Look through Nature up to Nature's God."

Let us, however, in all fairness, contrast with the foregoing inductions a fundamental corollary of the "New Philosophy," as promulgated by BÜCHNER in his renowned work on *Force and Matter*, and admire the forbearance of the present age when compared with that which dealt its blows upon Lord Bolingbroke. Thus Büchner—"Nature exists neither for Religion, for morality, nor for human beings, but it exists for itself. What else can we do but take it as it is? Would it not be ridiculous in us to cry like little children because our bread is not sufficiently buttered?" And, again, Büchner rejoices—"When the Emperor Napoleon asked the celebrated astronomer, LAPLACE, why there was no mention of God in his *Méchanique Celeste*, he replied—'Sire, I had no need of that hypothesis.'" And he quotes another authority, LALANDE, as saying—"I have searched the heavens, but have nowhere found the trace of a God." And COMTE exclaims—"The heavens declare no glory but that of Newton and Laplace!" When Newton was listening to a disparagement of the Bible by the great HALLEY, whom LALANDE regards as "the greatest astronomer of England," he simply answered—"Ah! Dr. Halley, you must not pronounce judgment upon that Book, for you have never read it."

These are illustrious men, employed with the infallible decisions of mathematics, and who laid the foundations of astro-

nomical science. Nay, more; they illustrate the divinity of the human Mind, and may not be employed by the adversary in opposition to it. How, then, shall we explain the difference of opinion between them and him who apostrophizes—"An undevout astronomer is mad"—for madness will not interpret the enigma?

Let us then leave the more simple, but magnificent designs of Earth and the Heavens, and turn our analysis upon Organic Nature, and here we shall almost see the Creator *in Propria Persona*—see His Creative Energy delegated to a system of designs which reach far beyond the compass of the human understanding, but as far as it can reach, sees nothing but the elaborate Designs of an Infinite Mind; in many of which the human Mind is deeply interested along with those which relate to the body. Indeed so profoundly is this the case in the organs of animal life (the senses and voluntary muscles), that those organs would be completely useless without the *self-acting Agent.* And although every part of the living being is distinguished by the most wonderful specific designs, many of which involve the operation of the Soul and Instinctive Principle, and all these incalculable designs concur together in one universal design of carrying out the well-being of the individual, yet those in relation to the Immaterial Agent are so strongly marked as exceptions to the organs of organic life (as in the foregoing examples), as to confound, at a glance, the doctrines of materialism—whether in respect to the Soul and Instinct or an active Principle of Life. And in close affinity with this subject let us ponder upon the wonderfully complicated mechanism for the perpetuation of living beings, constituted upon the same fundamental plan throughout the entire animal and vegetable kingdoms, and where every detail of the apparently endless variety evinces the highest order of Design, while the united whole is as much beyond the compass of man's imagination as the relative distances of the Earth from the remotest stars; and let us reflect upon what is here superadded, both in animals and plants, to the simply organic life of plants, as the organs of that life form the substratum of the designs that have been substituted for the original act of Creative Power. Marvellous peculiarities or modifications obtain in the fundamental plan in the different species. How wonderful

throughout all the mammiferous tribes the corresponding function of lactation, and in every species a provision that shall meet the precise exigencies of the offspring, however numerous or solitary, and nothing in excess; and all this set in operation, in every individual, at the critical juncture when independent life begins; while equally throughout the oviparous tribes either the Instinctive Principle takes the place of the lactiferous function, and prompts the animal to supply its progeny from the external world; or, in the descending scale of animal beings, we meet with as precise an adaptation of external agencies for the development and nourishment of the new being, where they are verging closely upon those provisions that are ordained for the corresponding exigencies of the vegetable embryo. The parental feeling which prompts the animal to provide for and protect its offspring is a part of the same great system of Design.

In the early times it was not unusual, in the absence of better light, for the anatomist to derive his convictions of a Personal God from dissections of the animal body. Such, for example, was true of Galen. Paley reasons from the mechanism of a watch to the necessity of its origin in a designing Mind. But what is a watch compared with the mechanism and all the surrounding circumstances of that institution for the perpetuation of man, animals, and plants, which has just been considered? But that wonderful provision is simply an isolated, dependent part of the organic mechanism—in no respect necessary to the life of the individual. How incomprehensible, therefore, must be that manifold complexity of designs upon which the sexual system is merely ingrafted. If, therefore, the mechanism of a watch be due to the contrivance of an intelligent Mind, with how much greater certainty do the organization and functions of animals and plants evince their origin in an Intelligence inconceivably exalted above that of human reason. Such, then, being our premises, it follows, as irresistibly, that the Mind which originated the design of the watch is precisely of the same nature as the Designer of organic mechanism and its manifold uses, and therefore that the Soul of man is as much a *substantive self-acting Agent* as the Great Creator.

The Infidel, however, will admit of no such parallels; he never alludes to the designs which make up the whole fabric of living beings, and from which all their functions result; whilst he is

constantly invoking, as we shall have occasion to see, the mechanisms of art as supplying examples of force similar to that which animates and governs the living being, and from which all intellectual and instinctive manifestations arise—but never referring to the mechanism of art as demonstrative of design, much less of a Creative Mind. Of this I shall have something farther when I come to the materialistic aspect of the organizing endowment of the forces of inorganic nature.

But I might have started, in presenting the foregoing display of Omnipotent Design, with the embryo from which all animated nature has proceeded since it was spoken into being in a state of full development—not even the vegetable world excepted; for with wonderful consistency with the creation of man and animals in a state of maturity, and as indispensable to Unity of Design and to the exigencies of animal life, it is affirmed that—"Every plant of the field was created before it was in the earth, and every herb of the field before it grew." There were, also, for like purposes, seeds in the earth ready for vegetation, as there were ova in animals ready for development.* And here we come upon the amazing profundity of Design in the germs of all animated nature—every germ embracing within itself the elementary conditions, the potential whole of the complicated mechanism of every animal and plant, and which, as will be shown, is, alone, fatal to the developmental schemes of Lamarck, Darwin, &c. And who can contemplate without reverential emotion the progress of development from the embryo state to the mature being—always in one preordained way, and that, too, with exact coincidence in every individual of the same species, but with certain modifications of the fundamental plan in every distinct species—while superadded to all this are the allotments of Instinct, with special modifications in every species, for the preservation and welfare of the animal; while the Soul of man is designed not only for those purposes, but for others which shadow forth the Divine Mind.

It is usual to set forth anatomical structure, and its general of-

* In respect to the germs of plants and animals, respectively, it should be also observed that Design is rendered more conspicuous in placing seeds in the earth, inasmuch as they are of annual production only; while the ova of animals are forever present.

fice, as forming the highest evidences of Design. But the universal principles upon which vegetable and animal organization is founded, and the analogies throughout; the special designs of every part, and their concurrence in the production of special results; the harmonious contribution which each receives from all the rest; the assemblage of the whole into one great universal design, by which the individuality of animal and organic life is constituted and blended together, so that the former is ingrafted upon the latter as an integral part; the vast and exact variety in the physiological constitution of every tissue and parts of tissues, and, according to the nature of the species, with their corresponding products and their susceptibilities to the action of physical agents and mental emotions; the almost endless and undeviating modifications of the organic products of every part, and according to the nature of the being; the various and compound physiological influences which are often concerned in a common function along with a highly complex mechanism, as in generation, respiration, vision, &c.; the exact adaptation of the digestive organs and fluids to the varieties of food consumed by different species of animals, and the subordination of the whole mechanism to the exigencies and final causes of those organs—as seen, for example, in that profound labyrinth of organs, the urinary, intended for the elimination of redundancies of blood, and discharging them at convenient times from the body—the vital relations of atmospheric air and water to every individual animal and plant through a wonderful variety of mechanism and stupendous laws; the precise adaptation of Instinct to the special exigencies of organic and animal life in the various species of animals, with peculiarities in every species; and, lastly, the involution of the laws by which each part, and the whole in the concerted action of all parts, are governed—all this forms a chain of evidence by which the advocates of the materialistic doctrines of Life and Mind, of spontaneous generation* and other developmental hypotheses, are shown not only to disregard an incalculable amount of the clearest and strongest facts, but, in so doing, to reject the Divine Author of all things.

* By spontaneous generation I mean the doctrine of the origin of living beings out of inorganic matter through its inherent properties and laws, or from some supposed existing organic matter under the influence of external physical causes.

Finally, we have seen that organic life is represented in the greatest simplicity in the vegetable kingdom, where, indeed, it constitutes the whole being. Ascending to man, we meet with the same fundamental condition, with certain organs and intellectual faculties ingrafted upon it, which are so impressive that they divert the attention from the fundamental, organic basis, and lead us to regard that condition as serving only as a basis to the superadded structure and faculties. And such, in reality, is the true relation in man of organic to animal life (page 36). The former would be worthless without the latter, and the latter would be useless without a directing Principle that shall adapt the whole mechanism to its endless relations to the external world, and to its own internal economy, and, therefore, a *substantive, self-acting* Principle. This is beyond any contradiction; and therefore, I say, if the organic mechanism of man, and the animal fabric which has been ingrafted upon it, are merely designed to subserve some great purposes which have no intrinsic relation to the exigencies of organic life—either the life of the brain or of any other organ—it would be a violation of all the rules in philosophy and of common sense to deny that some efficient, *self-acting* Cause is provided to carry out the ultimate objects of such an elaborate system of physical designs, and where the manifestations of such a Cause are without any analogies in the material world. The conclusion is also unavoidable that an organization which is so entirely abstracted in its fundamental economy from the operations of the rational faculty should be equally destitute of any allotment in generating its manifestations. But not exactly so in relation to animals, since they have other destinies than those of man, and therefore, for the fulfillment of those purposes, the Great Designer has rendered their animal mechanism and instinctive faculties mostly tributary to the maintenance of organic life and those other objects which are designed for the wants and happiness of the human race. The Instinctive Principle having no higher objects, it has been divested of those rational faculties which are peculiar to man. But Instinct in animals has no more participation in the functions of organic life than the Soul of man. It is simply designed, as will be fully seen hereafter, to provide for the wants of the animal and its protection.

These distinguishing attributes in the philosophy of the or-

ganic and animal life of man, and his associate tribes, are among the most impressive displays of Divine Wisdom (see *organic* and *animal* life, page 27). But before dismissing, for the present, this part of our subject, I would ask the Materialist whether he does not recognize in the ability of man to analyze the great Designs which make up the whole organic world, and to discover the complex relations of their integral parts, an Intelligence similar to that which devised and brought the Designs into being? and whether, also, if the "Maker of the eye can see," the creature who sees does not see in the same intellectual manner as his Creator, and therefore by a similar Rational Principle? Such, also, is the correspondence in the philosophy of all designs that those which man originates require an Intelligence of the same nature as those which have emanated from Almighty Power. If, therefore, the humble designs of man are the results of the operations of a material organization, so, equally, must be those which the Theist ascribes to Infinite Intelligence, and nothing, therefore, could have an existence but simple matter—at best in an organized condition. From which it follows, as a logical sequence, that *materialism*, or a disbelief in the substantive existence of the Soul, involves the revolting doctrine of *atheism*.

Or, how can any one be so untrue to his reason as to suppose that the displays of Design in living beings have sprung up spontaneously from the elements of matter, of which there are not less than sixteen or seventeen in every animal and plant, or from a "cell" or any other "primordial form?" The materialist assumes that the forces and laws of external nature could have started the animal into being, when he should know that those forces are destructive unless counteracted by a living organism. Or, if he begins with protoplasm, or a cell, or other primordial form, he should know that those forces, and all their attendant auxiliaries, could have never started the development of a fully-formed ovum of any viviparous animal, much less have carried it forward to the stage of infancy. Those forces, and the matter with which they are associated, would immediately destroy the ova if submitted to their action, or even if the ova be disturbed in their maternal relations. Moreover, there is nothing but a MATURE PARENT that can nourish for a moment the *newly-born mammiferous animal*, or provide for *unfledged birds;* and the Physiologist should

have known, also, that human parents, and all mammiferous animals, and the forementioned birds, must have been created in a *state of maturity both of body and Mind;* since, I say, if they came into being originally even in a state more advanced than infancy, but still dependent, they would have immediately perished from want of sustenance and protection. This would have been particularly true of the human infant; with no other instinct than that of sucking indiscriminately any object introduced within its lips, and of proclaiming its hunger or its sufferings by very audible cries for relief—all of which will be fully submitted to the judgment of the reader at a more advanced stage of our inquiries.

And here I should say, in consideration of thus presenting the foregoing as an original argument, that, so far as I have any knowledge, it was first employed by myself in my work on the SOUL AND INSTINCTIVE PRINCIPLE in 1848, and again in my work on THEORETICAL GEOLOGY, 1856. Subsequently, M. GUIZOT, in *L'Eglise et la Société Chrétienne* (1861), employs the same argument in relation to the human species, whence it has attracted the attention of others, particularly the DUKE OF ARGYLL, in his work on *The Reign of Law.*

I will now also inflict another blow upon *Darwinism*, and which will be farther considered in another place—that there is not, and never has been, an animal, however near its approximation to man, *that could have conducted for a moment the care of a being so absolutely devoid* of every rational, instinctive, and physical requirement for its own existence as the human infant—according to my former demonstration, in the works on the *Soul and Instinct*, and in the *Institutes of Medicine.* The facts are conclusive, and no one can resist their logic. The act of *mature* creation being thus demonstrated, whatever else is revealed in connection with the act must be received in an equally literal sense; and I thus obtain, therefore, another proof of the substantive existence and self-acting nature of the Soul — made after the "Image of God." Nor will I neglect reminding the Materialist that the same Revelation informs us that the living body was supplied with a Principle of Life. I shall also show, in the sequel, from the Materialist himself, that this doctrine must be believed "if it be a consistent Revelation to man." The Materialist, and all

other doubters, confuted as to the creation of man in a state of maturity, can no longer cavil at the Narrative.

As to the immortality of the Soul, it is, of course, insusceptible of *demonstration;* but the demonstration of its existence and purposes leave no doubt of its higher destinies. The objects of its connection with the body supply, alone, the highest probability that it is capable of an independent and immortal existence. These purposes, as we have seen, consist simply in connecting the Soul with the external world through the senses and voluntary muscles, while it has nothing to do, in any functional sense, with the organs of organic life; and which I have presented as a demonstrative proof that the Soul is a distinct Essence from the body—and farther, also, that it is totally wanting in plants, which are composed alone of the organs essential to life (p. 27). The analogy, however, as will be seen when I come to the consideration of the Instinctive Principle, can not be carried to animals, as to the immortality of that Principle, on account of the radical distinction between Reason and Instinct; while, on the contrary, all that relates to the purposes of Instinct denote its perishable nature. As it is no part of my object to consider the metaphysical arguments in behalf of the Soul, I therefore avoid all of that nature in proof of its immortality.

I shall now proceed to consider more specifically the materialistic doctrines, and reserve my farther demonstration of the Instinctive Principle for the last, with the exception of the Appendices, in the sequence of my inquiries. But thus far a demonstration of that Principle has been generally embraced in what has been said of the Soul. Still there remains much to be considered of the analogies and distinctions between them.

CHAPTER III.

THE DOCTRINES IN MATERIALISM.

WHAT has hitherto been said is equally applicable to materialism, whether it regards the manifestations of Mind as the result of a *chemico-molecular action* of the brain, or as *secreted* by that organ from the blood; and these are the only hypotheses that have any intelligible foundation. It is now my purpose to consider them more specifically in their relation to *causes.*

The *molecular* or *chemical* doctrine supposes that all acts of Intellection, all manifestations of the Will and Passions, all the impulses of Conscience, and all the adoration of the Deity, are results of "*the chemical action which the elements of the food and the oxygen of the air mutually exercise on each other.*" This is the hypothesis of "combustion," as laid down by LIEBIG, and as adopted by all chemical physiologists, and by all but a few materialists, who, however, often prefer the term molecular action to that of combustion. It is applied to all organic processes, to the function of respiration, &c.; and in respect to the brain it is regarded as the cause of mental phenomena, and of a waste, or "change in the composition of the substance of the brain" (Liebig). Carbon is the particular element which is generally supposed to be concerned in the process; and this is said to undergo "combustion" by its union with another element, oxygen, and to thus result in the production of animal heat. This heat is the materialistic "correlated force," according to the prevailing doctrine, which gives rise to the phenomena of Mind. The author of the doctrine in its essential feature, Baron LIEBIG, applied it to the production of heat throughout the body, and considered it the vital force; in which he is followed by the Correlators. He compares the body (the brain included) to a steam-engine, in its connection with the consumption of coal and evaporation of water, and says that—"*The body, in regard to the production of heat and force, acts just like one of these machines.*" This illustration, to-

gether with the entire hypothesis, has become a favorite with the materialistic school, and is often employed by them. Foreseeing its corrupting effects upon the whole domain of medicine, and that it was likely to become a basis for Mental Materialism, I devoted to its special consideration, in the *Institutes of Medicine*, nearly twenty-five years ago, more than seventy pages of that work (pp. 157–187, 234–279). Indeed, a few years before the appearance of Liebig's work ("*Animal Chemistry*"), in which the foregoing doctrines were extensively presented, there were such indications of their approaching invasions upon Physiology that I devoted an Essay to their consideration, under the designation of "Animal Heat," in the *Medical and Physiological Commentaries*, 1840 (vol. ii., pp. 9–78).*

As the foregoing doctrine of combustion, or "the chemical action which the elements of the food and the oxygen of the air mutually exercise on each other," is generally accepted as the basis of Materialism, I shall soon enter, in another chapter, upon its more critical consideration in connection with the arguments of its ablest advocates. The doctrine which ascribes the phenomena of Mind to the combustion of the *Phosphorus* of the brain, and which is peculiar to a few, is comprehended under the same general doctrine of chemical action. Nevertheless, in consideration of its "speciality," I shall bestow upon it some appropriate comments. It may be also said that the term "*molecular* action," although less definite than "*chemical* action," or "*combustion*," means nothing else in the philosophy of chemical physiology or in materialism; though it is unimportant to our demonstration whether it do or not.

It is my purpose at present to bring under a brief consideration more particularly the doctrine of *mental secretion*, which is less obvious than the chemical; and what I may say upon the

* Of that Essay it was said by the distinguished author of the "*Climate of the United States and its Epidemic Influences*," Dr. Forrey, in a review of the Commentaries, that—"Dr. Paine, it will be seen, in fact, anticipates the whole chemical theory of Liebig as set forth in his '*Animal Chemistry*.' This he has done not only in his work on the '*Philosophy of Vitality, and the Modus Operandi of Remedial Agents*' (1842), in which he controverts some of the German Professor's opinions advanced in the '*Organic Chemistry applied to Physiology*' (1840), but likewise in his '*Medical and Physiological Commentaries*' (1840), published before the appearance of either of Liebig's works."—*New York Medical Journal*, 1844.

subject will be equally applicable, in principle, to the molecular or chemical hypothesis, and will cover the whole ground now under examination. So, also, will our specific facts to be yet presented against the rival materialistic doctrine apply with equal force against the doctrine of Secretion. This latter hypothesis has, however, comparatively few advocates with that of the chemico-molecular, and is not, of course, tolerated by its rival, although it has a better foundation in the analogies of which it is the offspring. Among its most distinguished advocates may be reckoned CABANIS, and at the present time, CARL VOGT. It simply supposes that "*just as the liver secretes bile, so the brain secretes thought.*" The assumed analogy, however, is totally destitute of foundation. It might be sufficient, in proof of this, to simply say that the Mind and Instinct are wanting entirely in every known attribute of the products of other organs, and that the former are *sui generis* in all their characteristics. But there are other more absolute distinctions which completely destroy the supposed analogy. What, for example, is the efficient cause of the production of bile, saliva, &c.? Certainly, the blood, in connection with organic structure and organic actions—chemical, if you will. While these processes go on, bile, saliva, &c., are produced uninterruptedly; or, if arrested, it is from the failure of the organic processes. But it is just otherwise in respect to the Mind and Instinctive Principle. All their manifestations have completely disappeared during sleep, and often with great instantaneousness (page 76). All the avenues to the brain through the senses are completely closed, all *sensation* suspended, during profound slumber; nor can it be doubted that such is the condition of the brain itself in its relation to ideas. But to meet any sophistry about dreams, it will aid my demonstration to say that mental operations are only half suspended during sleep; and yet the organic functions of the brain continue to move on as perfectly as those of the liver, the lungs, &c., while, also, its incidental influences upon the organic functions of all parts are in no respect affected. Indeed, were any change of this nature to befall the brain it would be particularly manifested by some consequent modification of all the organic functions. The undisturbed continuance of all those functions and their products proves that organic life is everywhere in perfect operation, while, by equality

of reason, the suspension of all results in the organs of animal life proves that an Agent or Cause upon which the results depend, has ceased to operate. In one case organic functions, as well of the brain as of other parts, must go on without interruption, and therefore the moving causes upon which they depend must be in perpetual action. Those functions and their results possess, also, great uniformity in the several organs respectively, whether in sleeping or waking. It therefore follows, as a necessary consequence, that the manifestations of Mind, were they the results of a secretory process, should sustain no abatement, but should be as unchangeable and as uninterruptedly in progress as the bile, saliva, &c.; while the complete reverse of this is alone fatal to materialism, for precisely the same reasoning is applicable to the chemical or molecular doctrine as it respects the brain in its relations to other organs. In the case of the organs of animal life, or those with which the Mind is concerned (the senses and voluntary muscles), it is ordained that they shall have periodical repose, and therefore, by parity of reason, their spring of action is constitutionally fitted for quiescence as well as action, and this, as it respects sleeping and waking, corresponds with the alternations of thinking and not thinking during the waking time. The various gradations in the suspension of mental and instinctive functions, from their quiescence in the waking state to profound slumber, concur, also, in this part of our demonstration. Nor is it at all important to my purpose whether there be a complete suspension of the intellectual or instinctive functions. Nay, more, for a very impressive argument may be here drawn from the phenomena of dreams; and this I shall do in the language of that eminent writer and enlightened physician, Sir THOMAS BROWNE, as set forth in his *Religio Medici*, and which I place in the subjoined note.*

* "I thank God," says Browne, "for my happy dreams as I do for my good rest. We are somewhat more than ourselves in our sleeps, and the *slumber of the body* seems to be but the *waking of the Soul.* It is the *ligation of sense*, but the *liberty of Reason*, and our awaking conceptions do not match the fancies of our sleep. At my nativity my ascendant was the watery sign of Scorpius; I was born in the planetary hour of Saturn, and I think I have a piece of that leaden planet in me. I am no way facetious, nor disposed for the mirth and galliardize of company; yet in one dream I can compose a whole comedy, behold the action, apprehend the jests, and laugh myself awake at the conceits thereof. Were my Memory as faithful as my

But again: suppose some change in the organic condition of the brain as the cause of sleep; what is it, I say, that so instantly reinstates its natural functions when we pass from the sleeping to the waking state? What rouses that organ to its wonted secretion of Mind, or what, in the other case, the special chemical or molecular process? Certainly not the blood. Are there any analogies supplied by the liver or by any other organ? Do you assume, as is done by many, that some stimulus is propagated upon the brain by other organs? True, indeed; but in this perversion of a fact important in mere organic life, you betray a want of knowledge in the first principles of Physiology. Those influences from remote parts, which I have employed in my direct demonstration of the Soul, have not the most remote connection with the phenomena of Mind, but are wholly designed for the universal uses of the organic mechanism in carrying on its organic functions. The organs of life are in as uninterrupted progress during sleep as in the waking hours, and are as perfect in the idiot as in the rational man.

Thus, therefore, falls the only prop of materialism which it has fatally appropriated, in its consciousness that there must be some exciting cause acting upon the brain to bring that organ into action so far as it is concerned in the production of mental phenomena. But should Materialism assume that some imaginary stimulus, unknown to Physiology, is propagated upon the brain by distant organs, I ask, then, not only for the proof of this, but

Reason is then fruitful, *I would never study but in my dreams*, and this time also would I choose for my devotions; but our grosser memories have then so little hold of our abstracted understandings, that they forget the story, and can only relate to our awakened Souls a confused and broken tale that hath passed."

And thus Addison—*a coincidence*—"What I would here remark is, that wonderful power of the Soul of *producing her own company in dreams*. She converses with numberless beings of her own creation, and is transported into ten thousand scenes of her own raising. She is herself the *theatre*, the *actor*, and the *beholder*. This puts me in mind of a saying which I am infinitely pleased with, and which Plutarch ascribes to Heraclitus, that all men, while they are awake, are in one common world; but that each of them, when he is asleep, *is in a world of his own*. The waking man is conversant in the world of nature; when he sleeps he retires to a private world that is *particular to himself*. There seems something in this consideration that intimates to us *a natural grandeur and perfection in the Soul*, which is rather to be admired than explained. *The corporeal union is slackened enough to give the Mind more play*. The Soul seems gathered within herself, and recovers that spring which is broken and weakened when she operates more in concert with the body."—*Spectator*, No. 487.

what brings this remote influence into operation, either on awaking from sleep or under such an infinite variety of unique circumstances during our waking hours? Is there any conceivable analogy between such a cause, which is supposed to operate in the production of abstract ideas, in meditating, reading, writing, talking, &c., and the impressions which come to the brain through the senses? In what conceivable manner does such a cause modify the organic functions of the brain so as to excite the secretion of Mind, or how, in the other case, does it start the special chemical or molecular action upon which Thought is supposed to depend; and how are these special organic processes of the brain to be harmonized with those other processes of the organ which result in the secretion of serum, and in nutrition and the corresponding waste of the organ? Do the functions of any other organ supply the slightest ground for such conjecture? Will it interpret the reason why sleep is so prolonged in the habitually indolent, or, contrasted with that, why the laborious and exhausted student often sleeps less than others, whatever their occupation? Is it said that this is the result of habit, or of self-discipline; then, in either case, it is an admission of a self-acting Principle which rouses the brain from its state of suspended animal functions. It is a case, too, very strongly to our purpose, for it denotes a remarkable cultivation of the spiritual part which enables it to spring into active operation from a dormant condition in habitually exhausted states of the body; while the brain, according to materialism, should resist all wakefulness till that organ, and all other parts, are fully recruited by repose. But the Materialist is not convinced by the foregoing difficulties, although they command his acquiescence; and again, therefore, I ask him WHAT is it that directs the special molecular, chemical, combustive, or secretory process in all the acts of volition, in all the acts of intellection; or what brings them into operation?

We have now seen by the foregoing, as well as by various other demonstrations, that it can not be the blood, or any other physical influence appertaining to the body, which brings the brain into action in contributing to the mental functions. The blood is an indispensable stimulus to the brain, as well as to all other parts, in maintaining the organic processes. These processes and their results are without variation in the brain, as

everywhere else, in the natural state of the body. Moreover, if the blood were an exciting cause of the alleged actions which are productive of thought, there should be a continuous stream of Mind, and this, too, as well in the sleeping as the waking state; just as much so as a continuous flow of bile from the liver. Nor should there be any greater varieties in the manifestations of Mind than in those of other organs, if the manifestations depend upon the brain itself.

It is therefore variously demonstrable that the blood has nothing to do with the production of Thought as an exciting cause. But the common sense of all must perceive the necessity of some exciting cause, and that cause, too, of a *self-acting, originating* nature. It would be absurd to isolate the brain from all other parts, and make it the cause of its own actions as it respects the intellectual functions. That would be equivalent to a self-acting Soul without the co-operation of the material part; and therefore a greater wonder than the doctrine of a self-acting Agent associated with the brain—nothing whatever to start the supposed cerebral movements, and least of all to expound their results in the precise, unique, and infinitely diversified phenomena of Mind.

The necessity, therefore, of some self-acting cause, independent of the body, to bring the brain into action in the production of thought, becomes again, and again, a matter of clear demonstration. And have we not an analogical proof of this in the blood itself? Why should there be a doubt in the presence of this analogy, sustained by an imperative philosophy, of some corresponding cause to institute those actions in the brain that are necessary to thought, but with the superadded endowment of originating and suspending its own actions? This, indeed, is as demonstrable through the phenomena as the admitted fact that the blood is an indispensable stimulus to the organic functions of the brain, is itself acted upon by the organ, and appropriated, along with its phosphorus and carbon, to the nourishment of the organ and to its physical products. If, then, I say, such a fluid has been ordained either by God or nature for such a purpose, why should not One or the other have been sufficiently consistent to provide some special agent in connection with the brain for those functions which are totally different from its organic functions, which equally demand an exciting cause, and which

have, demonstrably, no connection whatever with the blood as an exciting cause?

The doctrine of mental secretion has, as I have said, comparatively few advocates with that of the chemical or molecular. The former, whenever it seeks for any other exciting cause, assumes, as we have seen, some impression transmitted to the brain from other parts. But of that I have disposed for the present, and what I have said in objection is alike applicable to the chemical or molecular; and although this latter doctrine finds it convenient to look to other organs for an auxiliary cause, it supposes that some external force of nature, such as caloric, is the special cause which brings about those movements in the brain that give rise to the phenomena of Mind. But it is assumed that these forces of nature are essentially one and the same, and are mere "modes of motion;" and it is farther assumed that there can be no Soul because such an existence is "inconceivable." But is it not more inconceivable that any external force should become the cause, through the medium of the brain, of the infinitely diversified phenomena of Mind, to which there is nothing in the least analogous in the inorganic world, even if such a force could institute and suspend at pleasure its own actions in its presiding office over the intellectual functions? And then as to the "modes of motion"—can any thing be more absurd than the supposition that an "external mode of motion" becomes so modified in the brain as to undergo at its own pleasure the infinite variety of modifications that would be necessary to the modifications of the actions of the brain in generating the endless variety of mental phenomena? But suppose that caloric, or any external force, is of a material nature, the same objections equally apply. It must be endowed with the self-originating power of bringing the brain into co-operation with itself, whether it relate to abstract processes of the Mind, or to the functions of the brain in its co-operative office of acting upon the voluntary muscles. The absurdity of supposing that such a cause could, of itself, institute or suspend its action upon the brain is too obvious for farther comment; and to surmise that some other unknown cause brings the physical force into operation, or suspends its action, equally involves the self-acting, originating, voluntary nature of that unknown cause. But such is ever *Materialism.*

And how, upon any other ground than that of an Agent perfectly distinct from the brain, will you expound the improvement of the intellectual powers by the discipline of education? You will not assume that it is the physical condition of the brain that is thus improved, any more than excessive quantities of food improve the organs of digestion. Indeed, as in the latter case, laborious study is liable to inflict injuries upon the brain. But if the organ can withstand the ordeal of great mental exercise, the final result is an immense gain to the intellectual powers. Moreover, the exaltations of the mental faculties being once established by education, they undergo no decline, although all farther means of improvement are discontinued. Is it the brain that has sustained this wonderful change, and which always remains at the ready summons of the Will? Or is it *caloric* that has undergone the improvement? The whole body may be slowly wasted by disease, as in phthisis, and yet the Mind continue as vigorous as ever. Are there any analogies supplied in the least degree by other organs? Can the liver be made to secrete more than its usual ratio of bile, and to maintain that augmented ratio? It is, then, in whatever aspect regarded, something totally distinct from the brain which is improved by education. Nor is that all. If the brain be considered the source of thought in its organic condition alone, how are facts treasured up, and ever present, from childhood to decrepit age—often becoming more vivid as old age approaches? As the brain, like all other parts, is constantly subject to renewals, the facts should go with the parts upon which they are supposed to be impressed, if the organ be alone their receptacle. The facts are a part of the organ itself, and can not, therefore, be transferred to the depositions of new cerebral matter. Why then, again, are the events of childhood fresh to the octogenarian, when those of the day are quickly forgotten? Why may Memory be trained with a special reference to particular subjects, and to a forgetfulness of others, or disciplined to a general compass of knowledge? But the Soul, on the other hand, being of an unchanging nature, as also the Instinctive Principle (as proved by these very facts), holds fast the treasury of knowledge or the improvements it may gain. And here we come to the demonstration, which, were there no other objection, would be fatal to materialism in either of its

shapes; for one hypothesis supposes that thought, &c., is the result of a molecular or chemical action of the brain, and the other of secretion. In either case, therefore, all ideas *should be as evanescent as the processes themselves.*

What, next, are your conceptions of Creative Energy? Are not, I repeat, the results of Mind, however separated from Infinity, precisely analogous to those which are everywhere seen as the offspring of an Infinite Intelligence? But if you admit a God, you will not reason from your debasing doctrines of the human Mind to the attributes of your Creator? And I ask the Materialist what answer will he make as to the condition of our Lord before His appearance upon the earth, and as He was "manifest in the flesh?" Was there no Spirit there? Nothing but material eliminations of Mind from the blood, or "a molecular action of the brain," or a combustion of its elements? For so you must have it, and so it is meant, where the same mental phenomena are so interpreted in man. Nay more, so complete is the analogy between the acts of Reason and those of the Creator, as seen in the humble designs which are devised and executed by man, and which, indeed, is all that we know of Him, except from Revelation, it would unavoidably follow, upon the doctrine of materialism, that all the Designs of the Almighty Being are equally the results of a conflagration of carbon or phosphorus, or of some molecular action, or a secreted product of organic processes!

The questions and arguments thus far propounded must be answered consistently, and in some conformity with the hypotheses drawn from analogy. If that can be done (the simple physiological requisite alone), then it must be conceded that the analogy is entitled to the gravest consideration. So, on the other hand, should the hypothesis fail in this indispensable requisite, *Materialism* must stand convicted of sophistry, insincerity, and atheism.

We have still before us an extended consideration of the materialistic doctrines; but in accomplishing this it will be necessary to present the facts and the arguments of their leading advocates, and I therefore admonish the reader that the discussion will necessarily become more or less controversial.

CHAPTER IV.

THE DOCTRINES IN MATERIALISM, CONTINUED.

I HAVE interrogated extensively the phenomena of Mind in pursuit of a cause, whether, as it regards the apparent independence of the body of all the complicated operations of Reason, or such as are more or less manifestly related to the senses, or involved in the inconceivable variety of voluntary movements as exemplified in the intonations of song, the modulations of speech, the influences of the Will in determining those precise motions by which the limbs are rendered instrumental in fulfilling the great objects of life both in man and animals, and the nature of which denotes a cause as originating, and as independent of the unvarying operation of the properties of matter or forces of nature, as Omnipotent Power. And with those problems of Thought and of the Will must be associated all the Passions and the minor Emotions—such as Love, Joy, Grief, Anger, Mirth, Sorrow, Revenge, Contempt, Hatred, Horror, Pride, Humility, Jealousy, Despair, Fear, Pity, Compassion, and other varieties of Sympathy, Love of Fame, of Music, of the Marvellous, of Notoriety, Avarice, Guilt, Curiosity, Astonishment, Respect, Desire, Cheerfulness, Melancholy, Sense of Beauty, Sense of the Sublime, Sense of Virtue and Vice, Friendship, Feeling of Delight, Selfishness, Generosity, Emotions of Taste, &c., &c.

Consider once more, and in connection with a more ample and critical detail, that every simple and complex idea, every act of the Will, every Passion and Emotion, every shade of variation in all this labyrinth of Mind, and whatever the rapidity and involution of the phenomena, each and every one, every variation would demand, upon the hypothesis of materialism, as many modifications, and as rapid succession of changes in the supposed physical cause. Many Passions and Emotions, such as Grief, Melancholy, Love, Jealousy, are often more or less in permanent operation, so that there must be not only an uninterrupted and special

chemical or molecular movement for each of the mental affections, but other chemical or molecular changes must be occurring simultaneously as Reason, Perception, the Will, &c., may come into operation, and without a conceivable exciting cause.

Moreover, the various Passions and Emotions, which would severally require, in their general aspect, a special chemical or molecular action, are liable to great diversities, each one of which must have special modifications of the several causes respectively. Of the diversities and complexities, for example, of Gladness and Regret, Brown remarks, in his "*Philosophy of the Human Mind*," that—"If every thing at which we rejoice and grieve, in the course of a single day, could be imaged to us at once—as we gather into one wide landscape the lake, and the vales, and the rocky summits, which we have slowly traversed—it would be one of the most striking pictures that could be presented of the social and sympathetic nature of man." Of the varieties of Desire, he says there is—"1st. Our desire of continued existence, without any immediate regard to the pleasure it may yield. 2d. Our desire of pleasure, considered directly as mere pleasure. 3d. Our desire of action. 4th. Our desire of society. 5th. Our desire of knowledge. 6th. Our desire of power, direct, as in ambition, or indirect, as in avarice. 7th. Our desire of the affection or esteem of those around us. 8th. Our desire of glory. 9th. Our desire of the happiness of others. 10th. Our desire of the unhappiness of those whom we hate."

The materialist does not deny the necessity of a cause for all this diversity, this instantaneous succession of diversified movements, and resolves the problem, as we have seen, upon the same principles as he interprets the physical phenomena that are in progress throughout the body. So far the brain is constituted like all other organs, which, in the mature body, undergo waste in correspondence with nutrition. But the Materialist superadds to the "chemical or molecular" actions of other organs that result in waste, certain special ones to the brain for expounding the phenomena of Mind. These special ones must also, and as he affirms, produce a waste of the organ; so that the two sources of waste would destroy all corresponding relation with nutrition, and the brain should speedily come to an end. If the brain manifests any peculiarities of organic function,

they are, equally with the organic physical phenomena of other parts, open to observation, equally depend upon manifest physical causes, and are equally governed by laws that are subjects of calculation. But how entirely the reverse of all this is whatever relates to mental and instinctive phenomena—every Thought, every act of the Will in its mental influences, or in those demonstrations it makes upon the voluntary muscles which I have so extensively considered. We seek for the exciting causes of the motions, the products, and all physical results of other organs, and we find them in the organs themselves; and herein the brain agrees with all other parts. But we seek in vain, among all these analogies, for any cause that will in the least explain the phenomena of Mind. The blood stimulates the heart, glandular organs, &c., and precise physical products ensue, and equally so in respect to the brain. There is no variation in causes or effects; or if the brain, as I have said, exerts certain peculiar influences upon other parts, they are purely of a physical nature, and are always the same under the same exciting causes, whether physical or mental. Now, therefore, since the strictest analogies obtain between the physical constitution of the brain and all other parts, and there is nothing apparent as the exciting cause of mental phenomena, we must seek for a cause in the phenomena themselves; and it is here we discover in their very nature something totally different from the exciting causes of the physical phenomena, since the latter are brought about by manifest physical causes, while the mental phenomena as clearly depend upon a *self-acting* cause.

If we ask the Materialist for the exciting cause of the supposed molecular action of the brain, to which all but the few of the school of mental secretion refer the manifestations of Mind, he either reiterates his assumed analogies or evades the inquiry by —"Science is satisfied with the molecular doctrine, but we do not know the WHY;" and so also the few who advocate the doctrine of mental secretion. In assuming the dependence of mental phenomena upon molecular movements in the brain, it is supposed that a precise, definite change is necessary to every particular thought, act of the Will, &c. Professor TYNDALL, in his Address at the meeting of the *British Association for the Advancement of Science*, at Norfolk, England, 1868, thus adverts to the doctrine:

"Granted that a definite thought and a definite molecular action in the brain occur simultaneously, we do not possess the intellectual organ, nor apparently any rudiment of the organ, which would enable us to pass, by a process of reasoning, from the one phenomenon to the other. They appear together, but we do not know *why*. Let the consciousness of *Love*, for example, be associated with a right-handed spiral motion of the molecules of the brain, and the consciousness of *Hate* with a left-handed spiral motion; we should then know, when we *love*, that the motion is in one direction, and, when we *hate*, that the motion is in the other—but the WHY? would still remain unanswered."—*Norfolk* (Eng.) *News*, Aug. 21, 1868. All that is very logical, and it is the principal object of this work to "answer the WHY?"

It is conceded in the foregoing quotation that the materialistic philosophy necessarily requires a precise, definite molecular or chemical movement, or, if you please, "a right-handed or a left-handed spiral motion of the molecules of the brain," for every thought, every simple and every complex Idea, every Mental Emotion, every act of Volition, and these movements must be as rapid, and as precisely simple or involved, as an idea may be simple, or as the rush of thought sometimes amazes us with its velocity, or resolves the most profound problems with an instinctive perception. Examples of this nature come readily to my demonstration. But let us take one of the most remarkable, and I ask the Materialist whether he can suit his doctrine of a "precise molecular action of the brain" to the exigencies before him —where, in a series of eighteen figures multiplied into eighteen, there must be a special, exact molecular action of the brain for the multiplication of each figure of one series into each figure of the other series, and as each is involved with the rest at every stage of the process, as much so as if only one figure were multiplied daily.

The illustration to which I refer is derived from a history, by the Rev. Mr. Stevens, of the early exploits of TRUMAN HENRY SAFFORD, at present (1870) the Astronomer for the Observatory at Chicago. It may be premised that, after a very superficial attendance at a country school in Vermont, with an attenuated frame and feeble health, this boy, at the age of nine years and six months, produced the "Youth's Almanac for 1846," having

made all the calculations of eclipses, the rising and setting of the sun, &c., &c., without any assistance whatever; and that in the thirteenth year of his age, and in the same unassisted manner, he calculated the orbit of the telescopic comet of November, 1848, and with an accuracy which is corroborated by the best astronomers. At the age of ten years he was thoroughly examined by the Rev. Mr. Adams in algebra, plane trigonometry, mensuration of surfaces and solids, pyramidal and spheric, cube roots, &c. The problems were of a very difficult nature, resolved mentally alone, and generally with great instantaneousness. I now come to the special illustration to which I have referred. "For the purpose of testing the reach of his mind in computation, he was finally asked to multiply *in his head* 365365365365365365 by 365365365365365. He flew round the room like a top, pulled his pantaloons over the tops of his boots, bit his hand, rolled his eyes in their sockets, until, in not more than one minute, he said 133491850208566925016658299941583225; which was written down while being delivered. What was still more wonderful, he began to multiply at the left hand, and to bring out the answer from left to right, giving first 133491, &c., [which was contrary to the usual 'spiral movements']. Here, confounded above measure, I gave up the examination. This last performance is not so interesting an illustration of the logical power of the child as others above given, but as a stupendous effort of computation it is absolutely inconceivable. We are impressed, indeed, with a sentiment of awe when we think what must be the power and fleetness of thought in the purely spiritual state, when such a child, by the mere accident of a peculiar organization, astounds us by such immeasurable compass and velocity of mind."—Nor was this early display of mind limited to mathematics, but took, in almost equal compass, every department of science with which it came in contact; and whenever the object of inquiry related to the higher branches of mathematics he commonly opened the works in their middle, and seized at once upon the antecedent premises upon which the inductions had been founded.

I am now led to revert to what I have said in my direct demonstration of the Soul of the two orders of nerves, the *sensitive* and *excito-motory*, the former of which is the medium through

which the senses transmit their impressions to the brain where the influences terminate, while other impressions are transmitted to the brain from remote organs through other sensitive nerves and there develop the nervous power or influence, which is then reflected from the brain upon other parts through the excito-motory nerves, and brings those distant parts into motion; and we also saw that the Will and the Passions do the same by their direct action upon the brain without the intervention of the sensitive nerves, but through the motor nerves alone (pp. 37–40). In the first place, let us look at the now almost universal substitution of the physical forces of dead, inorganic matter for a Principle of Life, and of which I shall have much to say when I come to the "Correlation of Vital and Physical Forces," as forming the present ground-work of mental materialism. And now I ask the materialist, the chemist, and the physical philosopher of life, to explain the mechanism of sympathy, or of those movements that are generated through the two orders of nerves, known as reflex actions (page 38), by the application of any principle in physics or chemistry. Let them, I say, consider that in every process of sympathy or reflex nervous action there are involved very diverse yet very precise effects, and that they must have one species of chemical change for the transmission of impressions through the sensitive nerves to nervous centres; another for the impressions exerted upon these centres; another for the reflection of the influences through the excito-motory nerves; and yet another for the effects exerted at the ultimate destination of the amazing round of the never-ending influences, as indispensable, for example, to the process of respiration; and coming to morbid states, there must be other series of chemical changes, conforming, respectively, to the nature of every morbid influence and product. Take any single attribute of the nervous system, and we shall find it as remarkably distinguished from all things else as is the mental principle, or this from the nervous influence. The physical power that appertains to that system is just as unique in all its operations. The distinction alone, in various aspects, between the condition of the *sensitive* nerves and those which are appropriate to the motor influence—those which transmit impressions to the central parts, and those through which the nervous influence is projected upon all parts of the

organism—those, I say, which serve to awaken the Mind, or to stamp on the nervous centres, with all the precision of thought, an inconceivable variety of influences which are unceasingly in progress in every other part, but with no other appreciable result than the movements which follow in all the organic functions, contrasted with the totally distinct prerogatives of those nerves, or those fibres of compound nerves which give rise to the distant movements and changes—place at an unutterable distance all analogy with the recognized forces of inorganic nature, and with every other agent in the external world.

Nor can we be surprised at the exquisite functions of the nervous power and sensibility as appertaining to the nervous system, when it is considered that the same system is the medium of all the rational, voluntary, and instinctive acts, which transcend, immensely, any of those vital influences which I have set forth as its characteristics, and which harmonize so wonderfully with the rational and instinctive manifestations. And if we now bring the Mind into its relations with the nervous system, what can task the understanding more than the step in the process of intellection as connected with the functions of sense; beginning with light and its properties, or with the odor which none but the dog can discern, distinguishing that which is impressed upon the footsteps of his master, or of a savage foe, from that of all other men, and that upon the track of one animal from all other animals, or the abstractions that convey to the mind all the varieties in taste, or the modified undulations of the air which render so distinct from each other all the gradations in sound from the Æolian harp to the braying of a jackass; the impressions of each undulation of light—seven hundred billions of the violet ray, and only less for all the rest, in a second of time—and of incalculable numbers in respect to the air; the impressions, I say, of each undulation, or of the indefinable odor, upon the extremities of the nerves of sense, one alone upon the eye, another alone upon the ear, and another upon the nose alone; the transmission of these impressions along the trunks of the nerves to their other extremities in the brain; their excitement of the brain, and the simultaneous operation of Reason or of Instinct, by which the nature of the primary impression is discerned, and the external objects realized by the inward immaterial agent, ac-

cording to their real material existence.* And if we now carry this philosophy one step farther, we shall be in the midst of that profound labyrinth of designs where the impressions upon all the senses meet harmoniously together—often simultaneously from a common source, as in the effects of gunpowder, on the discharge of a gun, upon every sense, when each impression transmitted to the brain confirms the report of the others through that Perceptive Principle which recognizes the exact amount, individually, or any discrepance of the whole. Or, through what other imaginable principle can it be that sounds, odors, &c., are unnoticed when we are intently engaged with subjects in which the senses are not interested, yet exert their full force on the instant that the abstract occupation ceases?

I may next interrogate the Materialist as to what gives rise to the *Consciousness* that all intellectual processes, all the acts of the Will, originate in a self-acting agent? He is silent under the

* As the chemical interpretation of the various sensations has become incorporated with physiological science, I may here refer the reader who may be disposed to investigate the subject to an attempt of this nature in the *Institutes of Medicine*, pp. 90–95. I will also farther say, that the only exposition of the process which has been made that is at all intelligible is relative to vision, while the other functions of sense are left to be expounded by that philosophy. But it will be readily seen that each of the senses is distinguished by such peculiarities in the subsidiary mechanism and their physical agents, that the chemical philosophy of vision is entirely inapplicable to either of the rest, while the doctrine which assumes the dependence of vision upon the union of oxygen with some combustible element of the retina, or any other physical rationale, is contradicted by the strict analogies between seeing, smelling, hearing, tasting, and feeling. The nerves and nervous centres are the organs in all the cases, and a great common principle is the physiological basis of the whole. That principle involves what are denominated sensibility, sensation, and perception. Any true theory, therefore, of the physiology of vision, in its essential nature, must be equally applicable to all other sensations.

Admitting, therefore, the assumption that external agents give rise to vision through the supposed chemical influences upon the retina, the philosophy should be the same for all the senses, and in conformity with what is known in chemistry of the coincidence of causes for coincident results. Now, in the case of vision, light is the agent which effects the supposed chemical changes in the retina, and, therefore, something at least analogous to light should start the chemical changes in the expanded olfactory, auditory, and other nerves which are the organs of those other sensations that are so nearly allied to vision. But there is no resemblance, in their nature, between light and all those volatile substances which impress the sensation of smelling, or those intrinsic causes which produce all the varieties of tasting, or the endless impressions which result in the various modifications of feeling, or in the intonations which are produced by the undulations of the atmosphere.

influence of his own Consciousness. Consider, also, how Consciousness operates, not only as an unceasing assurance of your personal identity, but is, as it were, a summary record, ever present to your mind, of all your former thoughts and actions; and the greatest characteristic of Mind is a *perpetual consciousness* of its own *self-acting* nature. The Materialist, therefore, is constantly reasoning in opposition to his own strongest convictions. But there is no test of Consciousness in the question before us comparable to that which relates to the Will. Here all is action, whether it concern the voluntary muscles or the exercise of the Will in its control of the other mental functions. Consciousness assures us, in all these demonstrations of the Will, that a *self-acting* Agent, originating the phenomena, is absolutely enthroned upon the Brain, issuing its mandates at its own sovereign pleasure—directing with inconceivable velocity the operation of every mental faculty—the exciting and regulating cause of every voluntary movement, of every articulate word which gives expression to our thoughts, and brings into instant subjection the most tumultuous passion. We feel it, we know it. All disbelief and doubt must yield to this irresistible conviction. Or if the Will be regarded as only the result of the concurrent action of other faculties of the Mind, it enforces the more the logic of our conclusions (p. 57). To deny a self-acting Agent, whatever other elements of the Mind may be concerned in the action of the Will, is a denial of one's Consciousness—a more certain testimony than any thing afforded by the senses. There is no possibility of referring the convictions of Consciousness to any imaginable function of the brain or other organs; and I now rest this *argumentum ad hominem* with the Conscience of the reader.*

No one will question the fact that, whatever it may be that gives rise to the Will and the Passions, they manifest in their results a powerful operation upon the brain, and through that organ upon various other parts of the body. How absurd, then, the supposition that the brain first develops the Will and the

* Professor Bain, in his "*Emotions and the Will*," expresses in a summary manner the opinions of Locke, Thomas Brown, and Dugald Stewart, when he says that —"The word Consciousness is identical with Mental Life and its various energies, as distinguished from the mere vegetable functions, the condition of sleep, torpor, insensibility, &c."

Passions, or, according to the prevailing philosophy of the "Correlation or Equivalence of Forces," a modified condition of caloric, without a conceivable exciting cause, and that this result then reacts upon the brain, and gives rise to the distant movements! Moreover, how does this caloric, or any other correlated force of inorganic nature, in its action upon the brain, give rise to all the variety in the phenomena of Mind, when its effects should be as simple as is its assumed operation upon other organs? And here we have thus come again upon the *modus operandi* through which the materialistic Philosophers obtain their Vital and Mental Forces for carrying on the molecular actions that give rise to all the physical products of the body, and to all the phenomena of Mind—the whole, in either series, being placed upon common ground. It is altogether the device of the chemical laboratory, in which the endless and unique manifestations of Organic Life and of the Intellectual and Instinctive Faculties have had no participation whatever. Chemistry is substituted for Physiology and Psychology, and the labors of Locke, and Stewart, and Reid, and Brown, and of all others of a kindred nature, are simply the monuments of a past epoch in mental philosophy.

According, then, to the promulgations of the Chemist's laboratory, which are now accepted as the basis of Physiology and Psychology, the assumed "molecular action of the brain" is the result of a force generated by a "chemical transformation of the substance of the brain," and the force thus generated is the *beau ideal* of the human Mind! It is a part of the connected whole, which embraces the entire organism. It is the same as alleged of the production of muscular and organic force, which is expounded by Liebig in the following manner, in his *Animal Chemistry applied to Physiology and Pathology*—

"All experience teaches that there is only one source of power in the organism, and this source is the transformation of the living parts of the body into lifeless compounds. This transformation occurs in consequence of the combination of oxygen with the substance of the living body."

The same doctrine is, as we shall have seen, variously expressed by our Author, and applied to the Mind as well as to the vital actions. It is the accepted doctrine, and will be critically examined when I come to the subject of the "Correlation and

Conservation of Forces." Dr. H. BENCE JONES, in his Croonian Lectures on "*Matter and Force*" (1868), appeals to the authority of Chemists for this foundation of his Lectures. He thus quotes Dr. FRANKLAND, Professor of Chemistry at the Royal Institution:

"*No one*," says Dr. Frankland, "*possessing any knowledge of physical science would now venture to hold that vital force is the source of muscular power.* An animal, however high its organization, *can no more generate* an amount of force capable of moving a grain of sand *than a stone can fall upward, or a locomotive drive a train without fuel.*"

The distinguished Lecturer then goes on to tell us of the absurd manner in which the doctrine of Force is deduced from the *crucible* and *test-glass*, and which is applied by Materialists as well to the Mind as the body. Thus—

"Professors Liebig and Playfair, and others, say that the chemical changes in the nitrogenous matter of the muscles are the cause of motion. [The Will has nothing to do with it, but a force developed in the brain by a similar chemical change in the organ.] Professors Frankland, Fick, and others, say that the mechanical work is much greater than can be accounted for by the amount of change in this matter, as *measured by the* UREA produced. They determine the amount of the mechanical work done in a given time, and *then translate it into its equivalent of heat*, weighing also the *urea* produced in that time. By *burning* a known weight of muscle *out of the body*, they determine how much heat it can produce; and from this they can calculate how much muscle must be *burnt in the body* to give an amount of heat equivalent to the mechanical work done in the given time. [! !] They then calculate what amount of *urea* this weight of muscle would produce. By comparing the actual amount of *urea* produced with the calculated amount, it appears that only one-fifth of the work can come from chemical changes in the nitrogenous texture of the muscles. Four-fifths of the work must arise from the chemical action going on in the non-nitrogenous matters in the muscles or in the surrounding blood."! ! !

Such are the absurd experiments of Organic Chemistry, designed to overthrow the Philosophy of Life and of Medicine, and to substitute mechanical forces for the human Soul, and thence,

by analogy, for the Divine Spirit. But this is not a new aspiration of Chemistry. It was long ago said by LOCKE, in his "Human Understanding," that—

"Let a man be given to the contemplation of *one sort* of knowledge, and that will *become every thing*. The mind will take such a tincture from a *familiarity* with that object that every thing else, *how remote soever*, *will be brought under the same view*. A metaphysician will bring ploughing and gardening immediately to abstract notions; the history of nature will signify nothing to him. A *Chemist*, on the contrary, shall *reduce* Divinity *to the maxims of his laboratory*, explain morality by *sal*, *sulphur*, and *mercury* [and he would have added *urea* had chemistry advanced as far], and allegorize the Scripture itself, and the sacred mysteries thereof, into the philosopher's stone."

And now Baron LIEBIG shall tell us how the same chemical change occurring in the brain gives rise to the force that brings about the phenomena of Mind; which is the accepted doctrine. And here I return to my position, that the entire body should disappear under the combined destruction arising from the organic and mental processes, as propounded by Chemistry; for, says Liebig, in his "Animal Chemistry"—

"Since in different individuals, according to the amount of force consumed in producing voluntary mechanical effects, unequal quantities of living tissue are wasted, there must occur in every individual, unless the phenomena of motion are to cease entirely, a condition in which all voluntary motions are completely checked; in which, therefore, these occasion no waste. This condition is called sleep. Now, since the consumption of force for the involuntary motions continues in sleep, it is plain that a waste of matter also continues in that state; and if the original equilibrium is to be restored, we *must suppose* that during sleep an amount of force is accumulated in the form of living tissue *exactly equal to that which was consumed* in voluntary and involuntary motion during the preceding waking period"—all of which is the merest chemical speculation.

HERBERT SPENCER has an interpretation of sleep, in his "*Psychology*," which is, of course, similar to Liebig's—"There has," he says, "necessarily established itself that rhythmical variation in nervous activity which we see in sleep and waking. Let us ob-

serve how these are interpretable, the one as a state of the nervous centres in which waste has got considerably in excess of repair, and the other as a state in which repair has made up for previous excess of waste." "During the day the loss is greater than the gain, whereas during the night the gain is diminished by scarcely any loss." And in this connection should be presented our Author's statement in his "*First Principles*," that—

"The FORCES which we distinguish as MENTAL come within the same *generalization*. Yet there is no alternative but to make this assertion." "Besides the correlation and *equivalence* between the EXTERNAL FORCES and the MENTAL FORCES *generated by them* in us under the form of sensations, there is a correlation and equivalence between sensations and those physical forces which, in the shape of bodily actions, result from them." "And how, it may be asked, can we interpret by the law of correlation the *genesis of those thoughts and feelings* which, instead of following external stimuli, arise spontaneously? The forces called *vital*, which we have seen to be *correlates* of the forces called *physical*, are the IMMEDIATE SOURCES *of those thoughts and feelings, and* ARE EXPENDED IN PRODUCING THEM." The same materialistic philosophy occurs in our Author's work on "*Psychology*," as follows—

"The centres which are the seats of Emotion undergo disintegration in the *genesis* of Emotions; and, other things remaining equal, thereupon become less capable of *generating* Emotions, until they are reintegrated."

And now, after referring the reader to what I have before said on the subject of sleep (p. 75), I would ask, How will the Materialist reconcile the assumption that sleep promotes an increase of living tissue in proportion to its assumed destruction by voluntary and involuntary motions during the preceding waking periods, with the vast disparities among mankind in regard to sleeping and waking, mental and bodily labor, &c.? Our facts would seem to denote even the reverse of the materialistic doctrine. Why are the sailor, the blacksmith, the farmer, and other hard-working people, who sleep only four or six hours of the twenty-four, far better provided with "living tissue" than the habitual, gormandizing sluggard, and with an "amount of force" which is proverbially "herculean?" Why are the muscles of their arms notoriously increased in volume? These facts, therefore, as well

as a multitude of others, contradict the materialistic assumptions in the most palpable manner.

But we will hear the accepted Authority, Liebig, rather more specifically on the question before us, and where it will appear that "*every thought, every sensation* lays waste the substance of the brain," and also that he regards Mind as the product of the brain alone, since, like all other Materialists, he considers that—"EVERY MANIFESTATION OF FORCE IS THE RESULT OF A TRANSFORMATION OF THE STRUCTURE OR OF ITS SUBSTANCE."

"Physiology," [that is, Chemistry,] he says, "has sufficiently *decisive grounds* for the opinion that every thought, every sensation, is accompanied *by a change in the composition of the substance of the brain;* that every motion, *every manifestation of force*, IS THE RESULT *of a transformation* of the structure or of its substance." "Thought, sensation," &c., are "manifestations of force," and are therefore "the result of," &c. Again, he says, that—

"The HIGHER phenomena of mental existence can not, in the present state of science, be referred to their proximate, and still less to their ultimate cause. [*Of course, therefore, not to a Soul.*] We only know of them that they exist." Again—"The efforts of philosophers, constantly made to penetrate the relations of the Soul to animal life, have all along retarded the progress of physiology. In this attempt men have left the province of philosophical research *for that of fancy.*"—On the contrary, I shall have endeavored to show, and have done so more directly in the *Institutes of Medicine*, that a knowledge of "the relations of the Soul to animal life" is not only attainable, but contributes largely to "the progress of physiology;" and most of all, that the imputation of "fancy" must recoil upon those who scoff at these sublime realities.

The foregoing doctrine, which is quoted from Liebig's work on "Animal Chemistry applied to Pathology and Therapeutics," has been generally accepted, and earnestly promulgated by distinguished leaders in "the British Association for the Advancement of Science" ever since their participation in that Work, and which led me to remark, in the *Institutes of Medicine*, in the Edition of 1847, that—"The gigantic physical school had too much of the Protean character, too little unity of purpose, and demanded greater stability. The learned men of a great Nation,

the British Association for the Advancement of Science, united in the object, and bestowed the honor of achieving the enterprise upon a foreign Chemist. The note of proscription has been sounded in high quarters in due conformity, and medical philosophy has nothing to hope even from a spirit of toleration. The subject, therefore, must be brought to the test of observation and reason, and he who arraigns the authorized doctrines will cheerfully abide an unsuccessful issue."

Among the members of that Association the President, Professor Huxley, has distinctly expounded, after his logical and cogent manner, the philosophy of maintaining the body inviolate under the waste of the "living tissues" far exceeding their renewal; but it does not appear to have occurred to him that the waste arising from *mental* operations is so much superadded to the natural organic waste, and therefore, *ex necessitate rei*, the entire body would succumb to the mental influences. Although the quotation does not immediately refer to the materialistic doctrines under consideration, it is a branch of the philosophy, and emanates from it. Thus, then, the President, in his late celebrated Lecture on the "Physical Basis of Life"—

"The *matter of life* is a veritable 'Peau de Chagrin,' and for every vital act it is somewhat the smaller. All work implies waste, and the work of life results, directly or indirectly, in the waste of protoplasm. *Every word uttered by a speaker costs him some physical loss;* and in the strictest sense, *it burns* that others may have light—so much eloquence, so much of his body resolved into carbonic acid, water, and urea. It is clear that this process of expenditure can not go on forever. But happily the protoplasmic *peau de chagrin* differs from Balzac's in its capacity of being repaired, and brought back to its full size, after every exertion. For example, this present lecture, whatever its intellectual worth to you, has a certain physical value to me, which is, conceivably, expressible by the number of grains of protoplasm and other bodily substance *wasted* in maintaining my vital processes during its delivery. My *peau de chagrin* will be distinctly smaller at the end of the discourse than it was at the beginning. By-and-by, I shall probably have recourse to the substance called mutton, for the purpose of stretching it back to its original size. A singular inward laboratory, which I possess,

will dissolve a certain portion of the modified protoplasm, the solution so formed will pass into my veins, and the subtle influences to which it will then be subjected will convert the dead protoplasm into living protoplasm, and transubstantiate sheep into man. Nor is this all. If digestion were a thing to be trifled with, I might sup upon lobster, and the matter of life of the crustacean would undergo the same wonderful metamorphosis into humanity. And, were I to return to my own place by sea (*ne sutor*, &c.), and undergo shipwreck, the crustacea might, and probably would, return the compliment;" and more of the same gossiping nature.

That is to say, the body is nourished by what we eat, but no more so by the hard-thinking man than by the idiot. Our Author, like all the rest of his school, has overlooked the fact that no more "mutton," and probably less, is eaten after a powerful intellectual effort at declamation, and that less of it is digested and "enters the *veins*," than after the body has been invigorated by a night's repose. It is then rapidly converted into blood, and is unceasingly applied to the repair of the natural waste, which is equally in progress during sleep as during the waking hours, whatever the amount of muscular or intellectual labor. Materialism has naturally imputed to the body those influences of sleep which are exerted upon the susceptible Principle of Life. It is that Principle, *and not the body*, which is invigorated by sleep, and through that, the Intellectual Faculties; and the physiological facts now before us are fully demonstrative of the error both of Chemistry and Materialism.

See, also, how the emaciated consumptive patient, with only snatches of sleep, toils at his intellectual labors, even after reduced to a slender diet of bread and water, and with a vigor of Mind unsurpassed in days of health and refreshing enjoyments. The whole history of the malignant epidemic cholera presents the Mind as sparkling as ever in the midst of the ruins of organic life, in which are included the brain as well as the almost pulseless heart, and the expiring functions of every other organ, closely representing the disembodied Soul.

Let us now look at another important fact that has been entirely neglected in all this speculation about the molecular action, combustion, and waste of the body, in its application to the

brain. It has been wholly disregarded that the brain is perpetually subject to such a powerful irritation transmitted from the lungs as to compel it to keep in motion the whole apparatus of respiratory muscles, and which knows no quiescence during sleep (p. 44). The "tissues" of the brain are, therefore, far more severely taxed by the process of respiration than by the Mind itself; and yet the brain, under all this accumulated work, and all that I have not here mentioned, which consists in the unceasing irritations that are propagated upon it from all parts of the body, in its office of maintaining, by reflex actions, harmonious relations among all the organs (p. 36)—notwithstanding, I say, all this accumulated work devolving upon the brain, the organ undergoes no more waste than the organs of sense (which enjoy the greatest repose during sleep), and equally, also, the ever-toiling respiratory muscles, and the never-failing heart, with its seventy-five or more pulsations in a minute, from the hour of birth to the last moment of life. This unceasing action of the muscles of respiration, of the heart, of the intestines, &c., is decisive against the chemical doctrine of waste; nor is there any better fact necessary to show the absurdity of the interference of Chemistry with Physiology. Already, however, is the chemical dogma of a waste of muscle, brain, &c., corresponding with the amount of work to which the organs are subjected, receiving its doom from later observations. We can have no better authority for this than a statement by Dr. JONES, in the Croonian Lectures for 1868, presenting a fact exactly the reverse of the chemico-materialistic doctrine, and which I maintained nearly thirty years ago in the *Institutes of Medicine*. But nothing is accepted in Physiology in these days but what proceeds directly from the Chemist's Laboratory. Thus, Dr. Jones—

"The experiments made by Dr. Parkes most completely confirm the view that the motion of muscle during exercise *does not bear any relationship* to the amount of chemical disintegration in the albuminous substance of the muscle. Indeed, he suggests the opinion that *the action of the muscle is not connected with disintegration, but with formation; that when it is* IN EXERCISE IT INCREASES, *and when it is quiescent it lessens in bulk*—that is, that it *more rapidly disintegrates during rest than during exercise;*" and therefore, also, so of the brain.

This startling sound from the laboratory is the doom of Chemistry in its application to living beings. It will gather force from all surrounding facts, and banish Chemistry from the field of Physiology and Medicine, and lay Materialism, in all its shapes, prostrate in that dust from which it emerged. We thus see that the hypothesis of chemico-molecular action and a corresponding waste of the body and brain, either as a cause or a consequence of mental processes, is the "baseless fabric of a dream;" or, rather, a bold assumption to serve as a foundation of *materialism*, both in respect to Organic Life and the Soul, and therefore a *reductio ad absurdum*. There can be no doubt, however, that muscular exercise may be carried to such a degree of violence that when long continued, and particularly if more or less attended by privation of sleep and food, a greater than the natural waste of the body will arise. But this is well known to be inappreciable unless critically determined by the scales, as often witnessed in armies after long and fatiguing marches.

If the reader be not weary of this discussion, which is pursued only on account of its forming the *basis* of materialism, I will now recur to my physical demonstration, by which the doctrine of chemico-molecular action and waste of the brain, or any "change in the composition of its substance corresponding to every thought, every sensation, every act of the Will," will be summarily confuted by materialistic premises.

Now, therefore, if there be any foundation for the doctrine, and according, indeed, to its absolute requirements, nothing should give rise to the special chemical or molecular action of the brain necessary to each particular Thought, act of the Will, Mental Emotion, or Sensation, but that exact state of the brain in which the special change consists—for that is the materialistic ratiocination—leaving, as we have seen, the chemical or molecular action, or other changes in the brain, without any imaginable cause. But I have shown that a great variety of things acting upon the brain will imitate exactly many of the phenomena of Mind. Thus, we have seen that the Will may imitate the spasms that are brought about by mechanical irritations of the brain, and, also, the spasms of hysteria that result from mental irritation or from irritations extended to the brain from other parts, and such as arise from irritations propagated to the brain by

teething or by intestinal troubles; that the Will also excites exactly the same movements of the respiratory muscles, in breathing, as are produced by the irritation of the brain that is propagated upon it from the lungs—the voluntary and involuntary act being undistinguishably alike. So, too, as we have seen, the Will may act upon the sphincter muscles exactly after the manner of that nervous influence which is permanently directed upon them by the inferior portion of the spinal cord, and by which they are held in contraction—the Will, in this case, acting upon the brain in the voluntary act, and in the involuntary a physical cause unceasingly operating upon the inferior part of the spinal cord. So, again, we have seen that the Mind will bring on vomiting like an emetic, on seeing another vomit, or from a recollection of its occurrence; and sneezing, also, after the mannner of snuff, by turning the attention strongly upon the nose. And equally, also, have we seen how the action of the Passions upon the heart and blood-vessels is imitated by alcohol, tobacco, &c., applied to the brain; besides other analogous illustrations which I have brought to the subject.

Now, in all these examples we must suppose that the brain is affected much in the same way as in that of the several physical causes, respectively; and surely nothing can be more absurd than the supposition that the physical causes institute certain chemical or molecular actions in the brain after the manner of the actions assumed as the cause of the Mental phenomena; for so it must be if the supposed chemical or molecular action obtain in the case of the Mind. As to the *nature* of the impressions exerted by the Soul upon the brain, or by physical agents applied directly to the organ, or by impressions coming through the senses, or by influences reflected upon it from distant parts, we know nothing.

Before dismissing this fundamental doctrine in materialism, I will refer to another indisputable demonstration which I have made, that a *self-acting Agent* is associated with the brain as the exciting cause of every act of the Will upon the voluntary muscles, and of the Passions upon the involuntary; and therefore of every mental phenomenon—that is to say, all the involuntary movements to which the brain contributes, such as those of the muscles of respiration, &c., and all such as depend immediately

upon other parts of the nervous system, as the sphincter muscles, are demonstrably owing to an excitement of the brain, or of other parts of the nervous system, by physical influences determined upon them either by external agents, as by light upon the brain, through the optic nerve, in the case of the iris, or by some irritation transmitted from the lungs to the medulla oblongata of the brain in respiration. Hence, I say, it follows by an irresistible analogy, that the phenomena of Mind, as manifested in voluntary motion, &c., require just as much an exciting cause acting upon the brain, as the organic phenomena which are admitted to require a physical cause acting upon that organ or upon other parts of the nervous system; and that Cause, as we have seen, must be of a *self-acting* nature.

Materialists are apt to refer to the extreme doctrines in Phrenology in proof of the dependence of the phenomena of Mind upon the brain alone. That there is a general foundation for Phrenology is indisputable, as, for example, the rational faculties are generally most strongly pronounced in those individuals who have the greatest development of the anterior part of the brain. Nor would it be at all inconsistent with the doctrine of the Soul should Phrenology prove to be true in its minuter details. The brain being the organ of the manifold operations of the Soul, it would seem, *a priori*, probable that its various parts are specifically designed for the special uses of the Agent which the organ subserves. But these details are not only not demonstrated, but they are contradicted by what we observe in animals. This is obvious enough in the greater proportional Instinctive faculties in some of the inferior tribes where there is only a ganglion for a brain, as in the honey-bee, than in the superior animals, where the development of the brain approximates that of man, as in the quadrumanous tribes, and who are destitute of the rational faculties. This, therefore, goes with the rest in proving that the brain is merely an instrument through which some Agent, capable of originating actions, performs the work of mental operations, and increases the obscurity attending the functional relations to the Mind of the various parts of the human brain. The following enlightened opinion of J. Stuart Mill upon this subject, in his "System of Logic," will be regarded at least as impartial:

"Admitting the influence of cerebral conformation to be as great as contended for — that is, the supposed connection between the strength of different mental propensities or capacities, and the proportional or absolute magnitudes of different regions of the brain, as taught phrenologically—it would still be a question *how far the cerebral development determined* the propensity itself, and how far it only acted by modifying the nature and degree of the sensations on which the propensity is phrenologically dependent. And it is certain that in human beings, at least, differences in education and in outward circumstances, together with physical differences in the sensations produced in different individuals by the same external or internal causes, are capable of accounting for a far greater portion of character than is supposed even by the most moderate Phrenologists. There are, however, many mental facts which do not seem to admit of this mode of explanation. Such, to take the strongest case, as the various instincts of animals, the portion of human nature which corresponds to those instincts. No mode has been suggested, even by way of hypothesis, in which these can receive any satisfactory, or even plausible explanation, from psychological causes alone; and they may probably be found to have as positive, and even, perhaps, as direct and immediate a connection with the physical condition of the brain and nerves, as many of our mere sensations have."

In regard to our Author's opinion of Instinct, it will probably appear, from what I have yet to say upon the subject, that no inferences can be derived from the structure of the brain and nerves of animals as to their participation in the operations of the Instinctive Principle, and as little in regard to the human brain in relation to instinctive manifestations. The phenomena clearly refer themselves far more to the constitution of the Soul, and of the Principle of Instinct, than to the nervous system. So far as any thing is inferable from anatomical structure, it sustains this conclusion. Both the brain and the nerves of man and animals concur in showing that this is as true of the instinctive as of the rational manifestations, which are the true sources of information as to the part which these organs take in the mental functions. If we compare the phenomena with the brain and nerves of different animals, and those phenomena with the same

organs in man, it becomes the more evident, from their great disparity in the different tribes, that these organs have only a very subordinate agency in the intellectual and instinctive processes.

And so with the functions of other organs. The *motor* power of muscles resides in the muscles; but not, as HERBERT SPENCER has it in his "Psychology"—"Locked up in certain tissues and liberated by the nerves." It is a property of Life, the *vis insita* of Haller, brought into action by various causes, according to the nature of the function. Blood is the natural stimulant for all the organic functions; but the organs which perform them may be also stimulated to action by the nervous influence, as already variously explained. Other physical causes may have the same effect. But the nervous influence is the stimulus by which the motor power of the voluntary muscles and the muscles concerned in respiration is brought into action. The nervous influence is determined upon the voluntary muscles by the action of the Will upon the brain, and upon the respiratory muscles in voluntary breathing by the same direct action of the Will; but upon the involuntary muscles, and upon the respiratory in natural respiration, by reflex actions of the nervous system, induced by physical impressions propagated upon the brain by distant organs (p. 44). Farther: there is no corresponding relation between the brain and nerves, in respect to size, and the *motor* powers of the voluntary muscles of different animals. Many of the smallest birds and insects manifest far greater muscular power in proportion to their nervous system than the quadrumanous animals of the greatest development of that system; and the brain and nerves of a horse weigh only about two pounds, while those of a man have a weight of three or four pounds.

Nevertheless, it should be stated that so great is the paramount importance of the brain and nerves in the materialistic philosophy, that its principal British Expounder, HERBERT SPENCER, lays the foundation of his work on "Psychology" upon a very extensive and minute analysis of the composition as well as the structure of those organs, and particularly to serve as a basis for chemical interpretations.

And now, again, a few words more as to *Sensation* (p. 29). How do impressions made upon the brain through the medium of the senses enable us to appreciate the external sources from

which they proceed? How do we comprehend the details of an extensive landscape at a glance of the eye? The Materialist replies — through chemical actions instituted in the *retina*, and thence propagated to the brain with corresponding results in that organ. Every object, light and shadow, &c., in the landscape sets up a special chemical action in the retina and brain, and thus the brain recognizes the external objects. That is the chemical doctrine which supposes light to set in motion the elementary constituents of the retina; but it does not affect to explain how the landscape is thus impressed. There is also another and later chemical doctrine, which is too curious and characteristic of materialism to be neglected. But the Materialist shall express the philosophy in his own peculiar phraseology, and which will serve to exemplify the usage of Materialists in deriving illustrations of the vital and mental functions from assumed parallel devices of Art, and which has prevailed ever since Liebig brought forward, in his "*Animal Chemistry applied to Physiology*," the *Steam-engine* to prove that—"*The body in regard to the production of* HEAT *and* FORCE *acts just like one of those machines.*" And as to the special function of *Sensation*, exemplified by vision, we are told by HERBERT SPENCER, in his "Psychology," that—

"The propelled hammer explodes the unstable detonating powder in the cap; thus playing a part *comparable* to that of the concentrated pencil of light which causes decomposition in ONE of the minute sensitive rods of the retina. The explosion of the cap explodes the powder in the pistol; a change that may *symbolize* the setting up of decomposition in an adjacent ganglionic cell by a disturbed retina element. The flash from the mouth of the pistol [that is, the optic nerve] fires the brain, which, carrying the flame onward, BLOWS UP THE MAGAZINE [that is, the brain!]; and this serves to illustrate the action of the partially decomposed ganglionic cell, which propagates a shock through the afferent nerve to a large amount of unstable matter in the optic nerve, where an immense amount of molecular motion is thereupon disengaged."!!! This impulse reaches the brain, molecular motions are generated there, and vision follows.

What, then, I rejoin, enables us to recall, at remote periods of time, after the external objects have ceased to operate, all the in-

tellectual results of the original sensations? The Materialist replies, permanent images impressed upon the brain. But *how* represented or impressed upon the brain by the transient chemical or molecular motions? I ask, again, for the *Cause* which recalls those assumed images, and elects the precise ones, and without any confusion with others, from the myriads that are mixed up with each other, so that they will reproduce the intellectual results of the original sensations? The cause should plainly consist, according to the materialistic doctrine, of an exact renewal of the former chemical or molecular motions; but as the landscape, with its forests, hills and dales, river and cataract, flocks and herds, or other external objects, are no longer present to stir up the elements of the retina, or "explode its cells," and transmit the influence to the brain, *what*, then, rouses the chemical or molecular motion in that organ? The Materialist is thus coerced to the tacit admission of a *self-acting* Cause that reproduces the phenomena, and is as necessary to their reproduction as the physical impressions were to the original perceptions and ideas. One is as much a cause as the other; with the difference that the results of the original sensations can be reproduced only by a self-acting Agent, while the original physical impressions roused that Agent into action, by which the external objects were perceived and appropriated as a fountain of other ideas. The knowledge thus acquired remains afterwards at the disposal of the self-acting Cause, which simply calls upon the brain for more or less of its instrumentality. It is, beyond question, precisely similar in its nature to that by which the Creator recalls and reviews all the illimitable past. And since the foregoing is demonstrably true, it equally follows, from our premises, that all the original ideas relative to the landscape, or such others as may have had a different origin, must have been primarily discerned, appreciated, or originated, and held in memory by that self-acting Cause, which is forever able, at its pleasure, to reproduce the images, ideas, &c.

Again, if physical impressions upon the brain are necessary to Sensation, and to the knowledge which comes through that medium, or, in the language of materialism, if those exciting causes develop the cerebral actions in which the mental functions consist, then it becomes manifest that there must be equally an exciting cause of the movements which attend the mental processes

that are independent of Sensation. The logic is indisputable; from which it, again, follows that we must look to a self-acting Cause of the latter phenomena, and therefore equally for those ideas which are associated with Sensation. The impressions made upon the brain through the organs of sense are only equivalent to the impression made by external objects upon the senses, and serve merely to excite the brain, which, in its turn, brings the self-acting Cause into operation. That Cause then takes up the physical impression, and not only appreciates its nature, but elaborates from it a complicated series of ideas in which all the faculties of the Mind display their participation. The slightest suggestion through the avenue of the senses, or the utterance of a word, may pervade the Nations, and become the source of the most important consequences to mankind. "The fall of an apple" has led to the whole philosophy in Astronomy; and the eating of an apple has contributed to all the sinful thoughts and actions of the human race, led to the stupendous Dispensations of the Old and New Testaments, and modified the original design of the Creator in regard to his rational creatures. And yet, say the Materialists, this was only a series of "chemical or molecular actions" in all the brains of mankind set in motion by *an apple.*

I was a little premature in saying that Chemistry does not profess to explain *how* a landscape is depicted upon the retina of the eye. This achievement was effected as early as 1849 by one of the ablest Chemists who has yet flourished, but a thorough materialist in respect to Life, the eminent Professor LEHMAN. The reader will observe that he has not been unmindful of Liebig's parallel between the steam-engine and the human body. Thus our Author, in his "Physiological Chemistry"—

"Weariness of the senses is the diminished impressibility of the nerves of sense, but its cause can not reasonably be sought for in any other than a CHEMICAL CHANGE experienced by the conducting substance of the nerves. Such a *chemical metamorphosis of the nerves of sense* from external impressions can no longer greatly excite our astonishment, *since* we have witnessed the *unexpected* phenomenon of a picture produced suddenly, and as it were by magic, *from the chemical changes effected by the rays of light on an* IODIZED SILVER PLATE. [! !] Should we not be *equally*

justified in saying that the iodized plate, which, after being exposed for a few seconds to a strong light, gives *only faint* and half-effaced images, IS WEARIED LIKE THE RETINA, when, after repeated and continuous perception of an image, it gives back only the faint outlines of the object?" ! !

But, as I have said of this in the *Institutes of Medicine*, it is only an example of a vast amount of a corresponding nature by which I have endeavored to show that Chemistry and Physiology are profoundly distinct from each other, and that when the Chemist departs from his legitimate pursuit to gather laurels in Physiology, whatever may be his ability, he is acting the part of a mere Charlatan. Indeed, I have shown extensively in the foregoing work (pp. 779–784), that our distinguished Author himself justifies this conclusion.

CHAPTER V.

MATERIALITY OR IMMATERIALITY OF THE SOUL.

MANY profound thinkers who defend the existence of an intelligent Soul have been disposed to consider it a material substance, incorporated with the brain. But this is not *materialism*, as appears from what has been said in our last two chapters. The doctrine of the materiality of the Soul, however, involves some important problems which may well engage our attention. Mr. LOCKE, in his work on the "Human Understanding," presents the subject in its common acceptation, and was himself indifferent about the question of the Soul's materiality or immateriality, or even whether the *brain* itself be not endowed with the Mental Faculties—which would be still in no respect materialism. Hence he is supposed by many to have been a Materialist. But our quotations will show that he was an undoubting advocate of a distinct, intelligent Soul, while also, as will be seen, he considered the Soul to be immaterial.

"We have," he says, "the *ideas* of *Matter* and *Thinking*, but possibly shall never be able to know whether any mere material being thinks, or no; it being impossible for us, by the contemplation of our own ideas, without Revelation, to discover whether Omnipotency has not given to some Systems of Matter fitly disposed a thinking *immaterial* Substance; it being, in respect of our notions, not much more remote from our comprehension to conceive that God can, if He pleases, superadd to matter a Faculty of Thinking; since we know not wherein Thinking consists, nor to what sort of Substances the Almighty has been pleased to give that Power, which can not be in any created being but merely by the good pleasure and bounty of the Creator. For I see no contradiction in it, that the first, eternal, Thinking Being should, if He pleased, give to certain systems of created senseless Matter, put together as He thinks fit, some degree of Sense, Perception, and Thought. *I say not this that*

I would any way lessen the belief in the Soul's Immateriality. I am not here speaking of probability, but knowledge; and I think not only that it becomes the modesty of Philosophy not to pronounce magisterially where we want that evidence that can produce knowledge, but also that it is of use to us to discern how far our knowledge does reach; for the state we are at present in, not being that of vision, we must, in many things, content ourselves with faith and probability. And in the present question about the immateriality of the Soul, if our Faculties can not arrive at demonstrative certainty, we need not think it strange. All the great ends of morality and religion are well enough secured, without philosophical proofs of the Soul's immateriality; since it is evident that He who made us at first begin to subsist here sensible, intelligent beings, and for several years continued us in such a state, can and will restore us to the like state of sensibility in another world, and make us capable there to receive the retribution He has designed to men, according to their doings in this life. And therefore it is not of such mighty necessity to determine one way or the other, as some over-zealous for or against the immateriality of the Soul have been forward to make the World believe. Who, either on the one side, indulging too much their thoughts immersed altogether in matter, can allow no existence to what is not material, or who, on the other side, finding no Cogitation within the natural powers of matter, examined over and over again by the utmost intention of Mind, have the confidence to conclude that Omnipotency itself can not give Perception and Thought to a substance which has the modification of solidity." In another place he says, that—"Having no other idea or notion of *matter* but *something* wherein the many sensible qualities which affect our senses do subsist, so also by supposing a Substance wherein Thinking, Knowing, Doubting, and a Power of Moving, &c., do subsist, *we have as clear a notion of the* SUBSTANCE OF SPIRIT *as we have of Body;* the one being supposed to be (without knowing why it is) the *Substratum* to those simple ideas we have from without, and the other supposed (with a like ignorance of what it is) to be the *Substratum* to those operations we experiment in ourselves within. 'Tis plain, then, that the idea of *corporeal Substance* in *matter* is as remote from our conceptions and apprehensions as that of *Spiritual Substance*, or *Spirit;* and therefore,

from our not having any notion of the *Substance* of Spirit, we can no more conclude its non-existence than we can, for the same reason, deny the existence of the body; it being as rational to affirm there is no *body*, because we have no clear and distinct idea of the *Substance* of matter, as to say there is no *Spirit*, because we have no clear and distinct idea of the *Substance* of a Spirit."

No believer in a Creative Power can doubt the ability of such a Power to invest matter with Intellectual Faculties—either the brain or some *self-acting* material substance associated with the brain. But my demonstration proves that no such faculties appertain to the brain itself; and as an associate *material* intelligent Substance would constitute a *self-acting* Soul, such a Substance might be accepted but for two important reasons. The first of the two is the least important, namely, that such a supposition would lead the Rationalist to the conclusion that a material Soul would be no more destined for immortality than the brain with which it is associated; since he could with far greater reason deduce this conclusion from analogies supplied by other matter than the doctrine that the brain itself yields the phenomena of Mind, between which and the manifestations of all other matter there are no analogies whatever. Grant to the Materialist the ground that the Sentient Principle is *material*, and his sophistry will be strongly fortified. But it would be only a plausible sophistry, not the violation of all philosophy, as when he reasons from the common properties and phenomena of matter to those of the Mind, and confounds these together as one and identical.

The second and greater objection which I am to consider involves both *atheism* and *annihilation*. This must be readily granted, since the human Mind is manifestly constituted upon the plan of the Divine Mind, however low the former may be in its gradation. Indeed, all that we *know* of the Divine Being is founded upon what we know of ourselves. We reason from our own Thoughts to His, from our own Will, our own designs, &c. We *feel* our power of volition and our muscular and mental force, analyze our designs, and extend them and all our thoughts to infinity in pursuit of the *Cause* of all this wonderful work. Socrates, Plato, Cicero, and other such heathen Minds, doubtless reasoning in that same manner, and without our aid of Revela-

tion, were firm in the faith that the human Soul is closely allied to the Deity. Others, by the same process, have supposed that the Soul of man is a portion of the Deity Himself, and that death will restore this derivative part to the Original Whole. Plato derived a part of his triply-compounded Soul from the Deity, but believed it would continue after death in a separate state, as it had existed before its union with the body; and not, as has been attributed to him by many, that it would be united to the Deity.

SAINT-PIERRE remarks that—"The uninstructed human Mind turns its efforts towards heaven, and dwells with transport on innate feelings of infinity, eternity, glory, and immortality. It may even be said to feel the same kind of consciousness from impressions of this description, as from those which are merely corporeal. Our Minds may be considered an emanation of that Divine Mind which governs the world, in the same way as our body is made up of elementary substances, and affected in its operation by those influences which regulate the works of Nature at large." —*Harmonies of Nature.*

Such, then, being the constitutional tendency of the human Mind, and so cogent are the analogies between the human and the Divine Mind, we unavoidably conclude that the human Mind was created after the pattern of the Divine Mind; and it follows, therefore, I say, that if the Thinking, Willing, Designing Principle in man be *material*, so, also, must be his Creator. This revolting doctrine places the Deity on common ground with that matter which He is supposed to have created out of NOTHING; and the conclusion becomes unavoidable that all matter is self-existent, and therefore that the belief in a Creative Power is a mere delusion; from which it would follow that there is no future for the human race.

The foregoing argument is simply open to the objection, that a *material* God may be assumed to possess endowments that do not appertain to common matter. But who will doubt that, if this doctrine were admitted, it would be merged immediately into atheism? But there is no shadow of compromise with the common Materialist, who knows no other source of Mind than the brain itself; for then, by my irrefutable premises—the analogies between the human and Divine Mind—the apparent works of a

Creator would have been mere elaborations from common matter; which is equivalent to the self-existence of matter, and therefore to a denial of Creative Power. Hence the conclusion of my argument is that, if *immateriality* be necessary to the Supreme Being, it is equally so to the Soul of man, and therefore to its immortality.

The disposition of the scientific mind to grasp at the properties of matter for resolving the problems of Mind is well shown by SAINT-PIERRE, in his "Harmonies of Nature," when lamenting Mr. Locke's rejection of *innate ideas*, thinking that others would make it a basis for materialism. What, however, Saint-Pierre regards as innate ideas in animals are either the incidental consequences of the mental constitution of animals, or result originally from Sensation, as I shall endeavor to show when I come to the subject of Instinct. But there are peculiarities appertaining to the Instinctive Principle through which the physical constitution of the animal operates in a manner that is equivalent to Sensation, and determines ideas in conformity with the peculiarities of the species. These peculiarities may be called innate propensities; but they are not innate ideas. Objections may be reasonably alleged against innate ideas in man; so that the radical difference between the Soul and Instinctive Principle consists in the ability of the former to originate ideas independently of all sensation, while those of Instinct are more or less consequent upon its connection with the body. Indeed, our Author's contrast between what he regards as the innate ideas of animals and man leads to the conclusion that, were they of that nature, man is greatly excelled by animals in this endowment. But it will be seen that a critical test occurs in the manifestation of Instinct by the human infant, which our Author justly regards as parallel with the instinctive habits of animals. There can be, however, no greater mistake than the supposition that the sucking of the infant child is the result of innate ideas, any more so, indeed, than the same phenomenon in the infant animal; and therefore our Author's illustration by other examples is equally deficient in proof of innate ideas. Our Author, however, has mistaken innate propensities for innate ideas, and I therefore refer to him to show how a great thinker regards the question, and how easy a matter it is, in his judgment, to fall into atheism, and, also, as pre-

liminary to what will be ultimately said of the distinctions between the Soul of man and the Instinctive Principle. I now come to our Author, Saint-Pierre—

"Mr. Locke," he says, "was not aware that, by refusing innate ideas to man, he was furnishing arguments to *anarchy and materialism;* yet he ought to have felt that on a future day a conclusion would be drawn, not merely from his reasoning, but from his example and authority, that, since man had no innate ideas, all those which he acquired must be conventional; and that if notions of morality were thus arbitrary, the result would be that we are formed to act our parts in life without the benefit of directions from nature. Of his followers, some conclude that *physical laws only are to be obeyed, and fall accordingly into materialism*" —from which it will be observed that our Author regards the two propositions as *equivalent*, and of which much will appear in the following chapters.

Our Author goes on—"Had Mr. Locke bestowed a momentary reflection on the innate ideas of animals, he would have recognized their existence in every part of the world; he would have been satisfied that it was by means of them that a caterpillar, coming out of its egg, quits its original branch, and seeks pasture on a leaf which is as young as itself. He would have accounted in the same way for this insect choosing subsequently a retreat under a branch sheltered from wind and rain; for its weaving a shell with admirable skill for its own abode when in a state of chrysalis; and for its leaving a little opening to get out when metamorphized into a butterfly, although it can at that time have had no knowledge of either change from experience. A mind like Locke's could not fail to have contemplated with admiration the *regularity* of these operations, as well as those of the insect in its future condition of a butterfly. After creeping a long time like a worm, it is, all at once, provided with four splendid wings; it skims along the air, and sports with the winds without any previous instruction; it alights on flowers, sucks the honey from their nectarine glands, so long unknown to our botanists, follows through the air a little female previously unknown to it, and often of a different color, but invariably of its own species; finally this little female deposits its eggs, not on the frail leaf where she has lived herself, but on a permanent

branch, where they may brave the injuries of a winter, which, however, she has not yet experienced.

"Such considerations as these could hardly have failed to suggest the idea of man having, in like manner, his innate ideas. Has not the new-born child some kind of pre-sensation when it sucks its mother's nipple and extracts the milk? It discovers, after the lapse of a few years only, a presentiment of the kindness or ill-nature of those around it merely by their looks."

These opinions upon the subject of innate ideas have an important bearing upon the distinctions between the Soul and Instinctive Principle; and when I come to the consideration of the latter, I shall endeavor to show that what has been regarded as innate ideas have no existence either in man or animals, however much instinctive habits may appear to give plausibility to the doctrine; while, on the contrary, these habits are not even allied to the processes of Reason.

The propensity of minds in pursuit of science to convert the manifestations of matter into the evidences of the materiality of thought, sensation, &c., is strongly exemplified in instances of writers who stood upon doubtful ground, and particularly where the premises were purely hypothetical. Such was the case with Dr. HARTLEY'S hypothesis of "vibrations of the nerves and brain," and its application by the eminent philosopher and divine, Dr. PRIESTLEY, to the whole philosophy of Mind.

Hartley expounded all ideas, their associations, &c., all impressions transmitted to the brain by the senses, all voluntary and involuntary motions, by vibratory motions of the particles that compose the brain and nerves. Not that "the nerves themselves vibrate like musical strings, but vibrations or oscillations of the small, and, as one may say, infinitesimal, medullary particles." These vibrations occur in the brain in all acts of intellection, they "*generate ideas*," and, "whatever changes are made in the substance of the brain, corresponding changes are made in our ideas." And so of the nerves in their tributary functions to Sensation, voluntary and involuntary motion, secretion, &c.; and here we first meet with the philosophical terms of *motor* and *sensitive* nerves. Hartley also very consistently applies the same doctrine to the Instinctive and bodily functions of animals.

It appears, therefore, that this doctrine is essentially the same

as the chemical or "molecular motions" of a large proportion of the present school of materialism; though Hartley was perplexed with his doctrine, whether it would or not admit of the existence of a Soul.

No correct apprehension can be formed of Hartley's hypothesis of vibrations from Priestley's edition of his work, who has mutilated its language to suit his own views, omitted many sections, and substituted sections of his own, yet purporting to be Hartley's and under Hartley's preambles. The inquisitive reader, therefore, must consult the original edition of 1749, which was ostensibly followed by Priestley in 1775.

Hartley's hypothesis led him to infer the "doctrine of necessity," and he scarcely escaped the vortex of absolute materialism, as will appear by the following extract from his "Theory of the Mechanism of the Human Mind." Thus—

"It may be objected to the whole foregoing theory, as well as to the doctrine of vibrations in particular, that it is unfavorable to the immateriality of the soul, and *by consequence* to its immortality. But to this I answer, that I am reduced to the necessity of making a *postulatum* at the entrance of my inquiries; which precludes all possibility of proving the materiality of the soul from this theory afterwards. Thus I suppose, or postulate, in my first proposition, that sensations arise in the soul from motions excited in the medullary substance of the brain. I do, indeed, bring some arguments from physiology and pathology to show this to be a reasonable *postulatum*, when understood in a general sense; for it is all one to the purpose of the foregoing theory, whether the motions in the medullary substance be the physical cause of the sensations, according to the system of the schools, or the occasional cause, according to Malebranch, or only an adjunct, according to Leibnitz. However, this is not supposing matter to be endowed with sensation, or any way explaining what the soul is; but only taking its existence, and connection with the bodily organs in the most simple case, for granted, *in order to make further inquiries.* It does, indeed, follow from this theory that matter, if it could be endowed with the most simple kinds of sensation, might also arrive at all that intelligence of which the human mind is possessed. Whence *this theory must be allowed to overturn all the arguments which are usually brought*

for the immateriality of the soul from the subtlety of the internal senses, and of the rational faculty. But I noways presume to determine whether matter can be endowed with sensation or no. This is a point foreign to the purpose of my inquiries. It is sufficient for me that there is a certain connection, of one kind or other, between the sensations of the soul and the motions excited in the medullary substance of the brain; which is what all Physicians and Philosophers allow. I would not, therefore, be any way interpreted so as to oppose the immateriality of the soul. On the contrary, I see clearly and acknowledge readily, that matter and motion, however, subtly divided or reasoned upon, yield nothing more than matter and motion still. But then neither would I affirm that this consideration affords a proof of the soul's immateriality. In like manner the unity of consciousness seems to me an inconclusive argument. For consciousness is a mental perception; and if perception be a monad, then every inseparable adjunct of it must be so too, that is, vibrations, according to this theory, which is evidently false; not to mention that it is difficult to know what is meant by the unity of consciousness."

Although, therefore, Dr. Hartley, for the sake of his doctrine of vibrations, concedes that there may be a Soul, he has no work for it to perform, but it all devolves upon the vibrations or oscillations in the brain; and that he was intent upon making them the source of the Mental phenomena, and not a Soul, is manifest not only from his efforts to establish the relation of vibrations to Thought, &c., but from his appeal, as we have seen in the foregoing quotation, to "all Physicians and Philosophers as allowing that motions are excited in the substance of the brain (and therefore requiring no discussion), and a certain connection between them and the sensations of the Soul." The motions, therefore, or some other co-operation of the brain with the Soul in producing the phenomena of Mind, being admitted by all, Hartley could have had no other object in view than to show the entire dependence of Mind upon the cerebral motions; and this is also Dr. Priestley's opinion of the hypothesis. Every one who admits the existence of a Soul knows that it is entirely unimportant as to HOW the brain contributes its part in producing the manifestations of Mind; whether by "vibrations," "molecular

motions," "chemical changes," "combustion of carbon or of phosphorus," or some inappreciable mode of action. And so, on the other hand, if the brain be the only source of Mind, it is as unimportant as to HOW it operates in Thinking, Willing, &c., as it is in relation to the Soul, and would be equally inscrutable. The only question of any interest relates to the Soul, so far as Mental phenomena are concerned; and whoever wastes his breath in talking about the *brain's mode of action* is bent upon the exclusion of the Soul, however much the imputation may be evaded to avert "the prejudices against materialism." But there was something apparently novel implied by the term "vibrations" and deducing them analogically from Newton's vibrations of the solar rays, and something like authority in adopting their application to the nerves from Newton himself.

The same objection, therefore, exists to Hartley's doctrine, and through which it is equally identified with materialism, as is applicable to the doctrine of molecular motions or chemical actions, that, like the latter, there is no exciting cause, as in the case of a self-acting Soul, of the supposed vibrations in the brain in any of the acts of the Will, Reflection, Judgment, Memory, Imagination, Consciousness, or the Passions. The vibrations which are supposed to give rise to Sensation have alone an exciting cause, which consists of the physical impressions that are transmitted to the brain through the senses.

Our author's doctrine derives its importance not only from his eminence as a writer and the ingenuity with which it is conducted, and its attempted evasion of the imputation of materialism, but from the support which it yields to the prevailing chemical or molecular doctrine. It was also early seized upon by Dr. Priestley, warmly commended by him, and shaped into his own doctrine. Grant to Hartley's celebrated hypothesis of cerebral vibrations the merit he claims, nothing could then be alleged against the chemico-molecular one.

Dr. Hartley ingeniously predicated his hypothesis of a supposed parallel in physical science propounded very briefly by Sir Isaac Newton, at the close of his "Principia" and his "Optics;" who, indeed, was led, by his own theory of vibrations of the solar rays, to surmise analogous vibrations in the nerves as the cause which excites the brain to action in its connection with Sensa-

tion. But he did not apply the doctrine to an exposition of the phenomena of Mind; and it may be adopted by the soundest Spiritualist. Hartley, however, took it up where Newton left it, making those impressions upon the brain which are transmitted by external objects through the organs of sense. The reader will now be curious to know what Newton says upon the subject, and the ground upon which Hartley built up, as he admits, his Mental hypothesis of cerebral vibrations.

"Do not the rays of light," says Newton, "in falling upon the bottom of the eye, excite vibrations in the tunica retina? Which vibrations being propagated along the solid fibres of the optic nerve into the brain, cause the sense of seeing." "They may be propagated along solid fibres of uniform dense matter to a great distance, for conveying into the brain the impressions made upon all the organs of sense. For the motion which can continue long in one and the same part of a body can be propagated a long way from one part to another, supposing the body homogeneal, so that the motion may not be reflected, refracted, interrupted, or disordered, by any unevenness of the body." Then again he says—

"Q. 13. Do not several sorts of rays make vibrations of several bignesses, which, according to their bignesses, excite sensations of several colors, much after the manner that the vibrations of the air, according to their several bignesses, excite sensations of several sounds? And particularly, do not the most refrangible rays excite the shortest vibrations for making a sensation of deep violet, the least refrangible the largest, for making a sensation of deep red, and the several intermediate sorts of rays, vibrations of several intermediate bignesses, to make sensations of the several intermediate colors?"

Although all this is purely hypothetical, without a fact to sustain it, it transcends, incomparably, in intelligibility, consistency, and possibility, what we have seen of the chemical doctrine of the action of light upon the retina, or the explosive one, which is the latest in the series (p. 122).

Dr. Priestley regards the doctrine of vibrations of the nervous system, set in motion by Newton's theory of light, as amply sufficient to explain all the phenomena of Mind. Thus, in his "Introductory Essays" to Hartley's work, he banishes the Soul alto-

gether, and plants himself upon bald materialism with a commendable candor. Thus—

"If it be admitted," he says, "as I think it must be, that, for any thing that yet appears, vibrations in the brain may accompany and *be the cause of all our ideas*, there remains only one property of ideas, or rather of the mind, relating to them, to which, if the doctrine of vibrations can be supposed to correspond, the whole theory will be established, and that is the *association of ideas*. For it will be seen that this single property comprehends all the other affections of our ideas, and thereby accounts for all the phenomena of the human mind, and what we usually call its different *operations*, with respect to sensations and ideas of every kind." "It will stagger some persons, that so much of the business of thinking should be made to depend upon *mere matter* as the doctrine of vibrations supposes. For, in fact, *it leaves nothing to the province of any other principle*, except the simple power of *perception;* so that if it were possible that matter could be endowed with this property, *immateriality*, as far as it has been supposed to belong to man, would be *excluded altogether*." "I rather think that the whole man is of some *uniform composition*, and that the property of *perception*, as well as the other powers that are termed *mental*, IS THE RESULT (whether necessary or not) of such an organical structure as the brain. *Consequently, that the whole man becomes extinct at death, and that we have no hope of surviving the grave but what is derived from the scheme of revelation.*"

Then follows, in immediate connection with the foregoing quotation, the usual difficulty with Materialists in admitting an *associated principle* with the brain as an efficient cause in the acts of intellection. Thus—

"Our having recourse to an *immaterial principle*, to account for perception and thought, is only saying, in other words, that we do not know in what they consist; for no one will say that he has any conception how the principle of thought can have any more relation to immateriality than to materiality."

It only remains to be said of the foregoing doctrine, that it is unaccountable how so philosophical a mind as Priestley's should have failed of perceiving that the hypothesis of vibrations in the brain or nerves is without a fact to sustain it, or, granting its plausibility, it is equally difficult to imagine how he should have

neglected the obvious necessity of some self-acting cause to institute the cerebral vibrations. He plainly saw that light was necessary to set in motion the supposed vibrations in the optic nerve, and this at least, therefore, should have opened the eyes of such a man to the equal necessity of a distinct cause for the vibrations in the brain to which he imputes all mental phenomena. But, as we shall have seen, it is the besetting fault of every materialistic hypothesis.

Soon afterwards appeared his work on "Matter and Spirit," in which he endeavors to fortify the materialistic doctrine. In the mean time, however, the difficulty does not relate in the least to the *materiality* or *immateriality* of a Thinking Principle, known as the Soul; for it is just as difficult to conceive of one as of the other. Nor is there any more reason why there should not exist an *immaterial* than a material substance. One is just as probable as the other, in an abstract sense. Either would be on common ground as to our means of knowledge, since the existence of the *material* could be known only by those phenomena which are supposed to denote an *immaterial* Principle; nor does there appear to be any other objection to the hypothesis of a *material* Soul than those which I have already made (p. 128). The argument, therefore, which turns upon the *immateriality* of the Thinking Principle is a mere fiction, a mere pretense, as it were, to evade the question as to the Soul. But since the Materialist rejects the manifestations of Mind as any evidence of the existence of a Thinking Principle, it is especially an object of this work to institute precisely parallel examples between the results of the operation of physical causes upon the brain and the phenomena of Mind, and to thus put an end to the assumption that we can not reason from the latter to a self-acting Principle because we do not know in what it consists.

It should be said, in conclusion, of Priestley's materialism, that there existed in his case the remarkable inconsistency of an opposition to infidelity, which it is impossible to reconcile with his rejection of a Soul, and his avowal that—"*We have consequently no hope of surviving the grave but what is derived from the scheme of revelation.*" Had he ever carried his faith into the Narrative of Creation, he would there have found, in a wonderfully summary statement, that man was created, in all but his body, in a condi-

tion totally distinct from matter; that he was contradistinguished from matter in being endowed not only with a Soul but Vital Principle; for, as if anticipating the liability of confounding his Intellectual and Vital attributes with his material body, it is affirmed that, after the body was formed out of "the dust of the ground," the Creator proceeded to endow the fabric with Life and a Soul, as expressed in the most intelligible, popular language—"and breathed into his nostrils the breath of life, and man BECAME a living Soul." And it is this which Materialism rejects as a worthless thing. The Hebrew for *living Soul* has no application to animals, who are endowed, however, with an analogous Principle, as will appear when I come to the subject of Instinct in Chapter XVI.

Materialism, however, has devised an ingenious scheme for reducing man to the mere condition of inanimate matter; laying its foundation by first resolving the Principle of Life into the forces which govern the inorganic world, under the doctrine of the "Correlation or Equivalence and Conservation of Forces." I shall, therefore, next proceed to inquire into the merits of this new scheme.

CHAPTER VI.

CORRELATION OR EQUIVALENCE AND CONSERVATION OF FORCES.—EQUIVALENCE OF PHYSICAL, VITAL, AND MENTAL FORCES.—MATTER AND FORCE.

In the farther prosecution of our subject I shall now pursue MATERIALISM *in medias res*. In the fulfillment of this purpose we must go first to its latest, and, as denominated, its "scientific foundation." We are thus conducted at once into the novelties of the "*Correlation and Conservation of Forces*," or, as also denominated, the *Equivalence* or *Metamorphosis of Forces;*" which is a late invention to serve as a basis for *Organic Life*, and *Materialism* as it respects the *Soul*—and this accomplished, *atheism* becomes an easy achievement upon the same premises. The doctrine gradually insinuates itself by first reducing living beings, in a physical sense, to a level with inanimate matter. It is a primary object with Materialism to determine the latter point; for in so doing it discards all the evidences of a peculiar power known as the Vital Principle, or Vital Force, or Plastic Power (for these are equivalent terms); the evidences consisting of the peculiar composition, structure, functions, laws, and phenomena of living beings, and to which there is not the least resemblance in any object in the inorganic world. The Correlation doctrine, on the contrary, derives its premises wholly from the manifestations of inorganic matter, and it reasons from these premises to their causes; while *Comte*-like, it denies all such inductive philosophy to the phenomena or manifestations of a Principle of Life. It offers not a *single fact* having any bearing upon the question; and its identification of the Vital Force with the forces of inorganic matter is the greatest violation of inductive philosophy that has ever been inflicted upon science. Having derived its premises from the steam-engine, the combustion of charcoal, the effects of heat upon simple matter, electricity, the formation of crystals, and experiments in the chemist's laboratory, it assumes that its

identification of the Vital Force with physical forces is "conclusively demonstrated." The foundation of the scheme being thus laid, this absurd assumption is then applied analogically, and in a summary manner, to the Soul. With the same violation of all philosophical rules, it equally discards all the peculiar, unique, and infinitely diversified phenomena of Mind as a ground of reasoning; and assuming that its ground in regard to the Vital Force is established, and as the phenomena of Mind are manifestations of force, all mental processes are equally due to a force that is derived from the inorganic world. Materialism then proceeds upon this basis to discard all the Designs in nature as supplying any evidence of a Personal Creator, and that what is called God is nothing but the forces and laws of nature; and thence it deduces the doctrine of "Creative Law," or spontaneity of living beings, and the developmental schemes.

The reader can not fail of discerning at once as well the monstrous sophistry as the equally unscientific mode of thus disguising the subject. The phenomena or manifestations of the inorganic world form the ground of inductions in that department of nature, and can have no possible connection with our conclusions as to organic beings, unless a correspondence can be shown. For this purpose we must go to the organic being himself, and interrogate in the same way his position in nature; look at his manifestations, as seen in his peculiar composition, his structure, his functions, his infinite variety of vital, intellectual, and instinctive phenomena, which can alone conduct us to a knowledge of the powers and laws by which he is animated and governed. This only "scientific" rule, the only ground of inductive philosophy, or which common sense should recognize, assures us that we are far better informed of a peculiar Principle of Life, and of an Intellectual Principle, than we can possibly be, through their very limited manifestations, of the constitution and forces of inorganic matter. And what of God? By the same logical rule of interpretation we know more of the Creator through His works than we do of the works themselves; although, as we shall see, it is one of the expedients of Atheism in approaching the Theist to speak of Him as the "Unknowable." It would add nothing, indeed, to our knowledge of Him if He were manifested to us in the figure of man. In our conceptions of Christ we never think

of His Person, but of what he said and performed. His bodily appearance would convey to us nothing of what he was or is. And so it is with all mankind who have passed into history. What would be thought of him who should pronounce Homer "unknowable" because we have no record of his existence? We should be apt to conclude that the objector had never heard of his works. But he was one so well known by these tokens that seven cities contended for the honor of his birthplace. Now "the Unknowable" of the Atheist has a great advantage of Homer in respect of works. We know the illustrious of former ages far better than they were known to their cotemporaries, and a thousand-fold better than we know most of the people with whom we are daily conversant; and have no more doubt of their former existence, through their mental productions, actions, &c., than of the existence of the sensible objects immediately before us. To affirm, therefore, that God is "unknowable" is the shallowest pretense of Atheism. Indeed, we know so much of Him that it has been well said by the earliest writer—"Canst thou find out the Almighty *to perfection?*" And just so, in the same logical manner, we come to find out far more about the Principle of Life and the Soul than can be possibly done in respect to matter and its associated forces.

The Materialist, however, having planted himself, in the manner described, upon the ground of simple matter, advances to an assault upon the Soul, and finally besieges the "Gates of Heaven." We must, therefore, follow the doctrine from its incipient designs upon *Organic Life* through its menacing approaches to *materialism*, where the main battle is to be fought. Organic Life and the Soul being rescued from the delusive snare of the "Correlation or Equivalence of Forces," *atheism* will be simultaneously bereft of its new foundation.

Glimpses of the doctrine under consideration had long ago made their appearance, though not employed for the subversion of physiological science, or to subserve the purposes of materialism. Thus HOWARD remarks, in his "History of the Earth and Mankind" (1797), that—"I am apt to believe light to be the pure principle of fire, and of the electric matter, of which these are *modifications*." Dr. S. L. METCALFE, in his work on "Caloric" (1843), whose opinion will be quoted hereafter, was one of the

first that elaborated the doctrine so as to apply it to speculative purposes.

The doctrine before us assumes that what have hitherto been regarded as distinct forces of nature are convertible into each other, or that they are modifications of one force, or different modes of a common force, or metamorphoses of one force* (being equivalent terms), its modifications appearing under the aspects of heat, light, electricity, magnetism, gravitation, chemical affinity, cohesive attraction, Vitality, Reason, Instinct, and, in its ultimate tendency, Creative Power, or "Unknowable" or "Unknown Cause." These conditions of force are equivalent terms in their relations to different conditions of matter. The doctrine assumes, also, that this common force undergoes no waste, and never ceases to exist, as implied by the term "conservation," but that when it loses one aspect it takes on another—as light, heat, magnetism, Vital force, &c., are converted into one or the other according to their respective manifestations. But, although these modifi-

* It will be interesting to the medical reader to learn that the foregoing doctrine is intended also as a basis for the whole science of Medicine. This purpose is fully comprehended in a single sentence in Dr. H. BENCE JONES's Croonian Lectures, on *Matter and Force*, for 1868:

"The doctrine," he says, "of the *Conservation of Energy*, and of the inseparability of matter and force, will lead to an *entire change not only in Physiology and Pathology, but also in that most practical part of medicine, Therapeutics.*"

The medical reader will be also interested to know how this doctrine enables him to learn what "constitutes disease," and its mode of treatment, as presented in the following luminous exposition:

"Perhaps," says the eminent Lecturer, "we shall ultimately be able to estimate the increase or diminution of any one motion which, by affecting all other motions in a part or in the whole body, constitutes disease. When the disease arises from increased action, we shall restore that normal quantity and quality of motion in the body on which the health depends, by decreasing the motion or adding to the resistance to conversion; and when the disease arises from diminished action, we shall attain the same result by increasing the motion or lessening the resistance to conversion."!! "The medicines which are taken into the body have the same incapability as food to *create or annihilate force;* but they possess chemical energies by which, wherever they go, they take part in the motions of oxidation and nutrition which are going on there; and according to their chemical properties, they add to the motions, or increase the resistance to the motions that constitute disease. The questions, then, which must be answered before we can obtain CLEAR IDEAS of the actions of medicines in the body, are—1. What are the different motions which occur in the body? and how are these different motions related to one another? and, 2. How do different agents or medicines increase or diminish these different motions which occur in the different organs and textures?"

cations of force are presented to us as having a substantial existence, and ruling the material world, they are also said to be merely "modes of motion," consisting in *nothing*. It is also the usage of this class of thinkers to waste their efforts in proving what every one admits, namely, that *matter is necessary to force* as witnessed in the *inorganic* world; and therefore say the Materialists, there is no other force in living beings than such as attends ordinary matter, and can not be separated from it. That is the logic. Such has become the proselyting spirit of materialism, that this most difficult subject for all but the well-stored scientific mind has already presented its sophistry to the wonder-loving public, who are readily deluded by the bold assumptions, and the confident appeals to "modern science."

As it is my present object to show that the doctrine of the "Correlation and Conservation of Forces" excludes all but the forces that appertain to inorganic matter from living beings, and therefore expunges the Soul, my remarks will now bear particularly upon the vital aspect of the subject. But in the first place we will permit the advocates of the doctrine to express it in their own language. Thus, Mr. GROVE, one of the ablest and earliest projectors of the "Correlation and Conservation of Forces," remarks, in his elaborate Essay upon the subject, that—

"We thus get a reciprocity of action between the force which unites the molecules of matter and the magnetic force, and through the medium of the latter the correlation of the attraction of aggregation with the other modes of force may be established. I believe that the same principles and mode of reasoning as has been adopted in this essay might be applied to the *organic* as well as to the inorganic world; and that muscular force, animal and vegetable heat, &c., might, and at some time will, be shown to have similar definite correlations."

Dr. WILLIAM B. CARPENTER, in his Essay on the "Correlation of the Physical and Vital Forces," speaking in behalf of the powerful school of *materialism*, and after paying his respects to the Vitalists in the following manner—

"Another class of reasoners have cut the knot which they could not untie [we shall see], by attributing all the actions of living bodies for which Physics and Chemistry can not account to a hypothetical 'Vital Principle'—a shadowy agency that does

every thing in its own way, but refuses to be made the subject of scientific examination [just the reverse]; like the 'od-force,' or the 'spiritual power,' to which the lovers of the marvellous are so fond of attributing the mysterious movements of turning and tilting tables"—goes on to pronounce the scientific foundation of materialism, in the derivation of the Vital force from Heat, Light, and Electricity. Thus our Author—

"In a memoir of my own, 'on the Mutual Relations of the Vital and Physical Forces,' published in the Philosophical Transactions for 1850, I aimed to show that the general doctrine of the 'Correlation of the Physical Forces' propounded by Mr. Grove was equally applicable to those Vital forces which must be assumed as the moving powers in the production of purely physiological phenomena; these forces being generated in living bodies by the TRANSFORMATION of Light, Heat, and Chemical Action *supplied by the world around*, and being *given back again*, either during their life, or after its cessation, chiefly in Motion and Heat, but also, to a less degree, in Light and Electricity."

Such is the foundation for Mental Materialism. Dr. Carpenter's able American Editor, Dr. YOUMANS, in referring to his "argument," remarks that—

"As a creature of organic nutrition, borrowing matter and *force* from the outward world; as a being of feeling and sensibility, of intellectual power and multiform activities, man must be regarded as amenable to the great law that *forces are convertible* and indestructible; and as *Psychology* and Sociology—the *Science of Mind* and the science of society—have to deal constantly with different phases and forms of human energy, *the* New Principle must be of the PROFOUNDEST IMPORT *in relation to these great subjects.*"

And thus Professor JUSTUS LIEBIG—although we shall ultimately see that he advocates in the same work ("Animal or Organic Chemistry, applied to Physiology and Pathology") the existence of a "Vital Principle as controlling the chemical forces"—

"In the animal body," he says, "we recognize as the ultimate *cause of all force only one cause*, the CHEMICAL ACTION which the elements of the food and the oxygen of the air mutually exercise on each other. The only known ultimate *cause* of VITAL FORCE, either in animals or in plants, is A CHEMICAL PROCESS. If *this*

be prevented, *the phenomena of life do not manifest themselves.*" "All *Vital activity arises* from the mutual action of the oxygen of the atmosphere and the elements of the food."

Professor VIRCHOW, the distinguished *physiological Microscopist*, says that—"The old doctrine of a Vital Power is not merely erroneous, but a *pure superstition*, which can not conceal its relationship with the *doctrine of the devil*, and the search after the *philosopher's stone.*" And yet he speaks freely of the existence of a "Vital Force."

Dr. JONES, already quoted (p. 110), remarks in his "Croonian Lectures on Matter and Force," 1868, that—"The stuff which takes part in the living actions, and the forces which are inherent in that stuff are there, and indestructible and inseparable. Inorganic matter and inorganic force always exist together in living things, [but the matter not in an *inorganic* condition]; so that if a separable living force be also present, then we must admit that two totally different relations of ponderable matter and force must obtain in the same matter at the same time. The unity of nature will at least be preserved by our hesitation to admit the assumption of a force capable of creation and annihilation, until some *conclusive evidence* is obtained that there actually is in living things *such a force or forces capable of being separated entirely* from the matter of which *they are made.*"

There are two important assumptions in the foregoing quotation—1. *Inorganic* matter does not exist in "living things." It is all in an *organic* state; not a particle unorganized, even the bones. 2. There is no *inorganic* force that has any participation in the constitution or functions of living things. There is but *one* force, the Vital, and it is this which not only presides over all the functions of the body, but holds in combination all the elementary constituents of the organic compounds, and in absolute oppotion to all inorganic forces; and one of the certain proofs of this is the violence with which the inorganic forces take possession of the animal fabric after death, and quickly break up the organism into its elementary parts. Why do they never manifest the least tendency of this nature till after death, unless for the reason of the existence of a Vital Force which is completely opposed to their action? The Vital Principle is perishable; and it is the failure of that Principle which virtually constitutes the death of

the organic being, animal or plant. All this I have demonstrated, and to a great extent, in the *Institutes of Medicine;* and although long before the World, no one has attempted to invalidate that demonstration; and this I hold to be a proof that the "conclusive evidence" demanded was then before our Author.

At a subsequent stage of the foregoing Croonian Lectures, and by the same process of reasoning, the Soul of man is subjected to the same ridicule as we have recently seen of the Principle of Life from the slashing pen of Dr. Carpenter—

"The *Spiritualist*," says Dr. Jones, "who still holds the primitive idea of the perfect *separation of matter and force* may find full occupation for his reason in weighing the evidence on which his belief or internal conviction rests; but he must leave the investigation of the foundations of natural knowledge to those who can see no reason for faith in witches, ghosts, transmutations, and transmigrations. There are some who think little of scientific truth, but, comparatively speaking, care much to recognize the Almighty Will as the *primary cause* of all things. *We, who search for truth above all things*, are compelled, by our belief in the inseparability of matter and force in the *abiological* sciences, to work out the inquiry how far this inseparability holds true in the *biological* sciences also."

It is sufficiently manifest, therefore, and it will become more and more so as the discussion advances, that a primary object of the doctrine of the "Correlation or Equivalence of Forces" is not only an identification of the Principle of Life with the forces of inorganic matter, but as a logical consequence the Soul also, and that whoever, therefore, rejects a Principle of Life, and maintains that living beings are governed by the forces of inorganic matter, necessarily discards the doctrine of a Thinking Principle. And if, as we have seen, the unique and infinitely diversified phenomena of Life be rejected as evidences of the special nature of their *Cause*, it should be equally so with the phenomena of Mind.

Such, therefore, is not only the inevitable consequence of the identification of the Vital Principle with the forces of inorganic matter, but it is often presented by the advocates of the doctrine as a logical sequence in respect to the Soul. Thus an able Professor in Yale College, Dr. G. F. Barker, in a lecture on the

"*Correlation of Vital and Physical Forces*" (in Transactions of the New York American Institute, 1870), after stating, in the usual manner of the materialistic school, that sun-light is converted into the Vital Force of plants, and by them stored up for animals to become their Vital Force, remarks that—

"No doubt can be entertained that the actual energy of the muscle is simply the converted potential carbon of the food. A muscle, therefore, like a *steam-engine*, is a machine for converting the potential energy of carbon into motion."

Our Author next approaches the Mind, and after referring to Melloni's experiments in 1832, to show that changes of temperature occur in the scalp, and therefore inferentially within the skull, [but very far less than in the face,] according to mental processes, passions, &c., and remarking that—"In explanation of this production of heat the *analogy of the muscle* at once suggests itself"—then proceeds to say, after the usual manner—

"Nor do those facts rest upon physical evidence alone. Chemistry teaches that *Thought Force*, like muscular force, *comes from food;* and demonstrates that the Force *evolved by the brain*, like that produced by the muscle, comes not from the disintegration of its own tissue, but is the *converted energy of burning carbon* [the prevailing doctrine in materialism, p. 90]. Can we longer doubt, then, that the brain, too, is a machine *for the conversion of energy?* Can we longer refuse to believe that *our* THOUGHT *is, in some mysterious way*, CORRELATED TO THE NATURAL FORCES? And this even in face of the fact that it has never yet been measured?"

Such, again, is a very exact representation of the "Correlation of physical and Vital Forces," and its application as a substitute for the Soul; or the materialistic philosophy of evolving the phenomena of Mind out of "burning carbon" (p. 90, etc.).

It may be useful here to remark, in connection with the foregoing quotation, that in all acts of the Mind that are independent of Sensation, or influences that come to the brain through the medium of the senses, the Mind, as I have demonstrated, brings itself into action, and in all the former cases Sensation merely rouses the Mind to action, when it may or may not so act upon the brain as to give rise to manifestations in the voluntary and involuntary organs. In the one case it is the Will projecting the

nervous influence upon the voluntary muscles; while in the other, or where the involuntary organs are affected, it is the Passions projecting the same influence upon the heart, stomach, kidneys, blood-vessels, &c. Now, then, in respect to the *heat* which, as in the foregoing quotation, is constantly assumed by Materialists as a *cause* instead of its real condition as a *consequence*, its production is owing, in the examples presented, to the action of the blood-vessels which is excited by the sudden determination of the nervous influence upon them when certain Passions, surprise, &c., are in operation. And thus a *remote consequence* of Mental processes is assumed as the *cause*, and made to constitute the Soul of man. The general heat of the body, which is also assumed as the *cause* of vital actions, is at all times a *consequence* of the action of the vascular system maintained in operation by the stimulus of the blood; but, as we have seen, the nervous influence, as developed by certain Passions, may also be rendered a powerful stimulus to the action of the heart and blood-vessels, from which results an increased elaboration of heat and sense of "burning" in the face. But what reply will the Correlators make to the totally opposite effect of certain other Passions upon the temperature of the "scalp," face, &c., as when Fear blanches the skin and reduces its natural temperature over the whole surface of the body? And here comes up the profound problem relative to the nervous influence—that it is rendered stimulating or depressing according to the nature of the causes that may bring it into operation, whether Mental or physical, according to parallels already instituted; when we saw that Joy, Love, Anger, &c., are stimulating, Fear, Grief, &c., depressing, and of physical agents, alcohol applied to the brain rouses the action of the heart and blood-vessels, and an infusion of tobacco depresses their action (p. 43). This special view of the subject is extensively investigated in the Author's Institutes of Medicine.

The profound in one science, if superficial in others, are apt to imagine that they have compassed all the sciences, and to gather into the fold of that science all the phenomena of Nature. Thus Sir Humphrey Davy plainly saw that it is impossible to explain the phenomena of Life by any external laws. But habit, and ignorance of Physiology, inclined him, like other distinguished Chemists, to think it—"Possible that *one law alone* may govern

and act upon matter—an energy of *mutation* [something like 'Correlation of Forces'] impressed by the Will of the Deity; a law which might be called the *law of animation*, tending to produce the greatest sum of perception, the greatest possible sum of happiness."—*Essays on Heat, Respiration*, &c.

Now no believer in a Personal God doubts that He could have done all this just as easily as He thought proper to do otherwise. But these Philosophers have very generally, at the same time, a consciousness that they are at war with nature; and perhaps this can not be shown more impressively than in their own language. Thus, Sir Humphrey says—"It may appear *absurd* to suppose *any* analogy between attraction and gravitation, repulsion and projection, and the laws of Life." And why absurd? Because Sir Humphrey knew that there is no "analogy" between the phenomena of Life and those of inorganic matter; and the only proof which he offers of the analogy is the following interrogatory, which follows immediately the foregoing admission: "Is it not, however, perceptive action," he asks, "which must uniformly be accomplished with some peculiar motion in the nervous system, analogous to repulsion and projection? Is not the *association of perception* and irritative motions a law *analogous to attraction and gravitation?*"!!

Such, again, is the amount of fact and of logic, as I shall still have frequent occasion to show, that is brought in favor of the chemical and physical doctrines of Life; and I may add, also, that we have here, from this great mind, one of the earliest germs of the "Correlation and Equivalence of Forces," and Sir Humphrey even suggested it as a basis for materialism in respect to the Soul as well as to Life; for in the latter clause of our quotation "attraction and gravitation" are rendered equivalent to the Soul in being the "*law of association between perception and irritative motions.*"

A truthful statement can scarcely be expected from one who delights in the propagation of *atheism* where misrepresentation can subserve his purposes. But as Truth has nothing to fear from its perversion, we will hear the great Leader in the so-called "New Philosophy," as to the matter of the VITAL FORCE. Thus, then, Dr. LOUIS BÜCHNER, in his renowned work on "*Force and Matter*"—

"The notion," he says, "of a Vital Force is reduced to a walking shadow, and exists only in the brains of such individuals as have lagged behind the science. All those who have specially studied any branch of natural science touching the organic world agree now in regard to Vital Force; and the *term itself has become so obnoxious that it is rarely used.*"

But what of the "obnoxious terms" *materialism, atheism? Vide*, for answer, our Author's Preface to the Third and Fourth Editions of his work—and other writers, as will be seen, who are upon the same side. And the following quotation from the above work, *contradictory* of the foregoing, will show the worthlessness, insincerity, and rudeness of the opinion expressed in the preceding quotation. Thus—

"Life," he says, "is a peculiar and most complicated form of mechanical action, in which the usual *mechanical laws* ACT UNDER THE MOST UNUSUAL AND MOST VARIED CONDITIONS, and in which the FINAL RESULTS are separated from the ORIGINAL CAUSES by such a number of *intermediate links* that THEIR CONNECTION IS NOT EASILY ESTABLISHED."

CARL VOGT, the Author of the celebrated expression that—"*Thought stands in the same relation to the brain as the bile to the liver, or urine to the kidneys,*" should be heard on the fundamental question before us—

"The appeal to a Vital Force," says Vogt, "is merely a *periphrasis of ignorance.* It constitutes one of those back doors of which there are so many in science, and which are the *constant refuge of indolent minds* who will not take the trouble to investigate what appears incomprehensible, but are satisfied with accepting the apparent miracle."

The eminent Psychologist, HERBERT SPENCER, also forcibly justifies our position, that the doctrine of the "Correlation of Forces" is intended to serve as a basis for Materialism. I simply quote a comprehensive statement now, and shall hereafter employ this distinguished authority for the purpose of showing the best of the grounds upon which this "New Philosophy" reposes its claims to an "advanced stage of Science." Thus our author, in his First Principles"—

"Various classes of facts unite to prove that the *Law of Metamorphosis* which holds among *physical* forces holds *equally between*

these and the mental forces. Those *modes* of the unknowable which we call motion, heat, light, chemical affinity, &c., are *alike transformable into each other*, and INTO THOSE MODES *of the unknowable* which we distinguish as SENSATION, EMOTION, THOUGHT; *those, in their turns*, being directly and indirectly RE-TRANSFORMABLE *into the* ORIGINAL shapes."

Were a Principle of Organic Life admitted, distinct from the forces of inorganic matter, it would be a vain attempt to discard the Soul or a Creative Power; since, if it were conceded that the special manifestations of Life were indicative, as they are conclusive, of the existence of a peculiar Force, entirely different from those of the inorganic world, it would necessarily follow that the same philosophy must equally apply to the source of Thought and the Author of nature. But as the case now stands, they are all simply modifications of one force; and since "force and matter are imperishable," we are consoled by the reflection that the so-called Soul will be "immortal"—but when the body dies, it will be transmuted into heat, electricity, magnetism, &c., according to the matter with which it may become associated. The so-called Creator takes any of these conditions of force that are necessary to effect the organization of matter so that it shall result in the production of living beings. Such are the issues, either directly, or indirectly implied.

If it has been hitherto impossible to ascertain whether *heat, light, gravitation, electricity, magnetism*, &c., be absolute properties of matter, or in themselves distinct essences, or the results of some ethereal medium inappreciable by the senses, or, as now assumed, mere *modes of motion*, how great must be the absurdity of attempting to identify, or correlate, or transmute, or assimilate in any other mode, those several realities whose phenomena are so peculiarly characteristic of each one respectively, and so forcibly declare the individuality of each, and address themselves so strongly to the senses that no one, until a recent time, has deliberately attempted the enterprise of such a conflict with nature, and to thus establish a fame upon the ruins of this department of Science. It is enough to assure us if we contemplate the manifestations of these principles, or whatever they may be, and their laws in the inorganic world alone; and, on coming to the organic, what do we witness here? Do we discern any thing in the phe-

nomena of Life that should lead us to "correlate" the causes or forces and their laws which give rise to these phenomena, with the forces and laws that rule in the inorganic kingdom? Certainly nothing whatever. Every one knows that they are totally different from each other in every detail, and that as soon as the living being is dead, man, animal, or plant, every one of these characteristic phenomena has disappeared, and no one of them can be reproduced, with all the aid of heat, electricity, &c.; while, on the contrary, a corresponding demonstration of our philosophy is seen in the immediate onslaught of the forces of matter upon the body which has lost its power of resistance to these forces, and their reckless destruction of the entire organization. Contemplate, for a moment, the work of that wonderful Principle of Life, whose creative power in the perpetuation of organic beings has been substituted for the Creator Himself, and which defies the ordinary forces of physics and chemistry as they were set at naught by the Creator when He organized the living kingdom out of the "dust of the earth." See how, like the Almighty, it incorporates, through the mechanism which He established, the elements of matter into *organic* compounds, no one of which possesses less than three elements, often many—the blood not less than seventeen—in intimate union, while no *inorganic* compound has more than *two* elements in the same intimate union; nor can all the art of the Chemist, with all the forces of nature that he can summon to his aid, reproduce the most simple, unequivocal organic compound, although he have in his workshop the exact proportions of the elements of an organic substance which he has just decompounded. And next, carry your attention to the *structure* of both animals and plants, where will you find any thing in the mineral kingdom analogous to the most simple tissue of the humblest insect or plant, or any of their most simple compounds?

Universal observation has established the fact that physical and chemical forces, in their relation to the union of the elements of matter, terminate in binary compounds and the simplest juxtaposition of the molecules of matter; nor have they ever been known to effect an undoubted organic compound of the simplest nature, as will be more fully shown when I come to the subject of spontaneity of living beings. But in the mean time I may say that they can no more build up an organic fabric than a pile

of crumbling stones can work themselves into a temple. If we ask the Materialist for a parallel in the inorganic world with a living being, his only answer is, "A crystal of salt or of quartz, or a diamond, or a steam-engine." And thus he abandons the ground with assumed parallels, one from nature, and the other from art, which, of course, have not the slightest affinity with organic structure, not even in the aggregation of the molecules of crystals, but founded alone upon the superficial symmetry that captivates the eye; or in the case of the engine, because, as we have seen, it is worked by the combustion of carbon. Nevertheless, we shall ultimately see that an assumption is made that certain compounds which have been considered of an organic nature have been artificially imitated. But we shall also see that they yield no sign of organic matter, living or dead, and that the problem is beyond the reach of chemistry.

What, also, can be more opposed to the special phenomena attendant on every species of force than the assumption that they are all resolvable into modifications of mere motion—unsubstantial, baseless—nothing moved? The conception of such a condition is impossible. On the contrary, I say, is not something more implied by the great variety of specific qualities by which heat, light, electricity, magnetism, the vital force, are individually distinguished, than abstract modes of motion? Each of these forces has, also, a long code of laws peculiar to itself, and founded upon the phenomena or effects that are peculiar to each, and these laws making up the sum of the Sciences. Is it a mere mode of motion upon which the Sciences repose? Is it simply *nothing* by which the tree is dashed to the ground by a thunderbolt, and which sends its impulse through the air for many miles? Is it merely nothing which is pent up in a cloud till discharged into another cloud that contains less than nothing, and which are said to be positively and negatively electrified? Is there not as much a discharge of *something* which produces the impulse in the air and gives rise to sound, as the bell is *something* which, by its vibrations, does exactly the same; or as the stone is *something* which occasions analogous undulations in water when cast upon its surface? Consider, also, some of the phenomena of Light—those of the prismatic rays, for example. Can mere motion be separated in this manner into numerous parts, all possessing very

remarkable properties peculiar to each—each ray occupying a certian definite proportion of the spectrum; and which imply as much the existence of something as the substratum of motion as does the motion of a hail-stone in its descent to the earth, and in its collision with the leaves upon which light exerts its no less manifest action—to say nothing of the decomposing, chemical rays, which are as positive in their action upon the chloride of silver as an acid in decomposing an alkaline carbonate?

The parallel between the Force with which the voluntary muscles inflict a blow, the impulses of the heart, &c., and the violence of an electric shock, is worthy of a "science" which identifies the Vital Force with electricity and caloric; and it is only an extension of the same principle which ascribes the movements of a table to the mere contact of a finger. It must be conceded, however, that there is a consistency in this School which denies the existence of a Principle of Life and a Soul, and imputes all their phenomena to motion, in regarding the phenomena of electricity, caloric, &c., as owing to an ideal motion of nothing.

Let us now have an exposition of this philosophy of Life and of Mind which turns upon the molecular structure of a crystal; and I have at my hand an admirable exposition of the application of "Correlated Force" to the problems of Life and Mind, and of the process of reasoning pursued by Materialists in ascending by a series of assumed analogies, or rather, exact coincidences, from the formation of a crystal up to man; and this not only as it respects his Organization and Principle of Life, but, somewhat equivocally, his very Mind. The high Authority whom I quote offers, also, an ingenious exemplification of the manner in which the difficulties of Materialism are evaded and the doctrine thus persuasively and blandly enforced. Thus, then, the erudite Professor TYNDALL, in his Address at the meeting of the British Association for the Advancement of Science, 1868—

"There have been writers who have affirmed that the Pyramids of Egypt were the productions of nature; and in his early youth Alexander von Humboldt wrote an essay with an express object of refuting this notion. We *now regard* the Pyramids as the work of men's hands, aided, probably, by machinery of which no record remains. We picture to ourselves the swarming workers toiling at those vast erections, lifting the inert stones, and

guided by the volition, the skill, and possibly at times by the whip of the architect, *placing the stones in their proper positions.* The blocks, in this case, were moved by a power external to themselves, and the final form of the Pyramid expressed the thought of its human builder. [And now for the application.]

"Let us pass from this *illustration of building power* to another of a different kind. When a solution of common salt is slowly evaporated, the water which holds the salt in solution disappears, but the salt itself remains behind. At a certain stage of concentration the salt can no longer retain the liquid form; its particles, or *molecules*, as they are called, begin to deposit themselves as minute solids. As evaporation continues solidification goes on, and we finally obtain, through the clustering together of innumerable molecules, a finite mass of salt of a definite form. What is this form? It sometimes seems a mimicry of the architecture of Egypt. We have little Pyramids built by the salt, terrace above terrace from base to apex, forming thus a series of steps *resembling* those up which the Egyptian traveller is dragged by his guides. The human mind is as little disposed to look at these *Pyramidal* salt-crystals without farther question as at the Pyramids of Egypt without inquiring whence they came. How, then, are those salt Pyramids built up? Guided by analogy, you may suppose that, swarming among the constituent molecules of the salt there is an invisible population, guided and coerced by some invisible master, and placing the atomic blocks in their positions. This, however, is not the scientific idea, nor do I think your good sense will accept it as a likely one. The scientific idea is that the molecules act upon each other without the intervention of slave-labor; that they attract each other and repel each other at certain definite points, and in certain definite directions; and that the pyramidal form is the result of this play of attraction and repulsion.

"The tendency on the part of matter to *organize itself*, to grow into shape, to assume definite forms in obedience to the definite action of force, is, as I have said, all-pervading. *Incipient life*, in fact, *manifests* itself throughout the whole of what we call inorganic nature."!!

"And now let us pass from what we are accustomed to regard as a *dead* mineral to a living grain of corn. When it is examined

by polarized light, chromatic phenomena similar to those noticed in crystals are observed. And why? Because the architecture of the grain resembles in some degree the architecture of the crystal. In the corn the molecules are also set in definite positions, from which they act upon the light. *But what has built together the molecules of the corn?* I have already said regarding *crystalline* architecture, that you may, if you please, consider the atoms and molecules to be placed in position by a power external to themselves. The same hypothesis is open to you now. But if, in the case of crystals, you have neglected the notion of an external architect [or Vital Principle], I think you are bound to reject it now, and to conclude that the molecules of the corn are self-posited *by the forces with which they act on each other.* It would be poor philosophy to invoke an external agent [or Vital Principle] in the one case, and to reject it in the other."!—A seed is then supposed to be planted in the earth, and the same philosophy is then carried to the germination of the seed and the full development of the plant. "The duly expanded mind," the Professor then goes on, "would see in the process and its consummation an instance of the play of *molecular force.* It would see every molecule placed in its position *by the specific attractions and repulsions* exerted between it and other molecules."—"But I must go still farther, and affirm that in the eye of *Science* the ANIMAL BODY is just as much the product of molecular force as the stalk and ear of corn, or *as the* CRYSTAL OF SALT."

"Every particle that enters into the composition of a muscle, a nerve, or a bone, has been placed in its position by *molecular force.*"—We come now to the Soul—"You see I am not mincing matters, but avowing nakedly what many *scientific* thinkers more or less distinctly believe. The formation of a crystal, a plant, or an animal is, in their eyes, A PURELY MECHANICAL PROBLEM, which differs from the problems of ordinary mechanics in the smallness of the masses and the complexity of the problems involved. Here you have *one half of the dual truth.* Let us now glance at the *other half.* Associated with this wonderful mechanism of the animal body we have phenomena not less certain than those of physics, but between which and the mechanism we discern no necessary connection. A man, for example, can say, I *feel*, I *think*, I *love;* but how does *consciousness* infuse itself into

the problem? The human brain is said to be the organ of thought and feeling; when we are hurt, the brain feels it; when we ponder, *it is the brain that thinks;* when our passions or affections are excited, it is through the instrumentality of the brain." Then follows the illustration of spiral motions of the molecules of the brain as exponents of the origin of thought, already quoted in Chapter IV., p. 103.

Probably no one entertains a doubt that the brain is concerned in all the acts of the Mind, especially in voluntary motion, and when the Passions operate. But no one knows better than our Author that there is not a single fact to show in what manner the brain contributes its instrumentality. The doctrine of molecular action I shall have sufficiently shown to be a mere assumption, and the assumed corresponding waste of the organ to be absolutely contradicted by facts. Nor has it the least bearing upon the question before us, which relates entirely to the "WHY?" or the *Cause* which brings the brain into action. As to the manner in which the brain contributes to the phenomena of Mind, or if it be *alone* the *Cause*, the way in which it does it is utterly unimportant. The whole discussion about "molecular action," "spiral motions," &c., is merely designed as a plausible pretense for materialism, and none but Materialists undertake the question. When the Professor says that—the "WHY would still remain unanswered" (page 103), it is a culmination of his antecedent reasoning in the absolute doctrine of materialism, and it will be ultimately seen that he carries it out to its consistent end. But his illustration of Life and Mind is a compact and probably the best example of the materialistic ratiocination. As usual, however, it is entirely regardless of all the unique phenomena of Life and of Mind, and of all the distinguishing characteristics of the mineral and organic departments of nature—never, indeed, adverting to any one of them as denoting a difference, but assuming the phenomena of simple, inorganic matter as the only recognized ground of reasoning—save only the ignorance which mistook the Pyramids as the product of the Earth, and which is made the basis of an equally unfounded assumption of a coincident structure and force between minerals and living beings, enforced by the *eclat* which has crowned Von Humboldt's exposure of the ignorance.

The Materialist, well knowing that there is as total a want of analogies and resemblances between a crystal and a seed or egg as there is between an egg and the Pyramids of Egypt, compares the seed and the egg to a crystal, because they are symmetrical in form, and built up of particles of matter "by the play of molecular force after the manner of crystals," completely ignoring the fundamental difference in their elementary composition and all the unique variety of structure presented by the organic germs. Let us, then, after the manner of Professor TYNDALL, plant a seed in the earth, and with it deposit the most symmetrical gem; and let us extend his illustration by placing an egg and another gem under a hen—the crystal having been neglected in this particular by the Professor in his comparative illustration—what result do we witness? In the one case, the development of the seed into a plant, reproducing similar seeds, in the other an animal bringing forth similar eggs; and so on through all the generations since the days of Adam, every species of plant and every species of animal forever preserving their individuality, and all their original, minutest characteristics, and without the vegetable kingdom to animate and combine the elements of matter into organic compounds the whole animal kingdom would disappear from the earth. And what of the planted and incubated crystal? Even less changed than the structure which forms the groundwork of our Author's illustration, "the Pyramids of Egypt," some of which have been sadly rifled and mutilated by barbarous hands. And yet would the doctrine of the "Correlation of Forces" inculcate the belief that living beings are endowed with no other properties, governed by no other forces, than the simple conditions of matter, and its projectors ridicule, as we have seen, the "Vital Principle" as the conception of a shallow imagination.

There is also apparently no end to the specious parallels which are instituted between living beings and the devices of art (more of which are yet in prospect before us), that may contribute, along with the simple phenomena of inorganic nature, towards their reduction to a common level. And yet is this expedient, which is not even a clumsy illustration, of the most mischievous influence, as it addresses itself to the popular mind, which is not only incapable of detecting the fallacy, but rather regards it as a demonstration; while the scientific mind that is conversant with or-

ganic nature looks on in dismay. Lord Bacon animadverts in the following manner upon this disposition to fortify a doubtful cause by auxiliary means which have no relationship to it—"I see sometimes," he says, "the profoundest sort of Wits, in handling some particular argument, will now and then draw a bucket of water out of this well for their present use; but the spring-head thereof seemeth to me not to have been visited."

Or, according to Göthe (*Mephistopheles*)—

> "For when ideas have grown scant,
> A ready word supplies the want."

One more example, from Professor Tyndall, will assist the judgment of the reader. Thus, in his work on "*Heat considered as a Mode of Motion*," Professor TYNDALL says—

"But we can not stop at Vegetable Life, for this is the source, mediate or immediate, of all animal life. In the animal body vegetable substances are brought again into contact with their beloved oxygen, and they burn within us *as a fire burns in a grate. This is the source of all animal power*, and THE FORCES IN PLAY ARE THE SAME IN KIND AS THOSE WHICH OPERATE IN INORGANIC NATURE. In the plant the CLOCK *is wound up*, in the animal *it runs down.* But surely as the force which moves a clock is derived *from the arm which winds up the clock, so surely is all terrestrial power derived* FROM THE SUN."!!

Or, as Liebig has it—"The self-regulating STEAM-ENGINES furnish no unapt image of what occurs in the *animal body.* The body, in regard to HEAT and FORCE, *acts just like one of these machines.*"

BUCHNER, also, in his work on "Force and Matter," brings the STEAM-ENGINE into service, and improves upon Liebig. Thus—"The steam-engine is, in a certain sense, *endowed with life*, and produces, as the result of a peculiar combination of force-endowed materials, a united effect, which we use for our purposes, without, however, being able to see, smell, or touch the effect itself."

Many others have the same parallel between man and the steam-engine, and it now plays a conspicuous part in the chemical philosophy of Organic Life and Mind; and as it is among the best of its arguments, or rather is its very best, it has been

repeated here and elsewhere in quotations from several of its ablest expounders, and also to avoid the imputation of any misapprehension which the nature of the argument might otherwise suggest. The device originated with LIEBIG; but the principle had been fully propounded by others. Thus, Dr. BILLING, in his "Principles of Medicine" (1838), presents it in the following language and typography—

"We have in the LUNGS A CHARCOAL FIRE constantly burning, and in the OTHER PARTS a WOOD FIRE, the one producing *carbonic acid gas*, the other *carbon*, the *food supplying*, through the circulation, the vegetable or animal *fuel*, from which the *charcoal* is *prepared* that is *burned* in the *lungs*. It is thus that animal heat is kept up"—a phenomenon which I have shown extensively in the *Institutes of Medicine* (pp. 234–279), and in the *Medical and Physiological Commentaries* (vol. ii., pp. 1–78), to be wholly the result of vital action, analogous to the process of secretion.

About the time of Billing's work, Dr. ROGET embellished his "Bridgewater Treatise on Animal and Vegetable Physiology" with the following graphic description of the apparatus, and the office which each part fulfills in the generation of animal heat, or vital power of the Materialists. Thus—

"The food supplies the *fuel*, which is prepared for use by the *digestive organs*, and conveyed by the pulmonary arteries to *the place* where it is to undergo *combustion*. The *diaphragm* is the *bellows* which feeds the *furnace* with *air;* and the *trachea* is the *chimney* through which the carbonic acid, which is the product of combustion, escapes."

We are constantly asked, How we know the existence of the Vital Properties or Powers? Again I say, by precisely the same means as the advocates of the chemical and physical doctrines of Life defend their knowledge of the forces which govern the inorganic world. The question is important, as implying that Physiologists either do not arrive at their knowledge of causes through their effects, or that there is nothing different in the phenomena of organic and inorganic beings. What would the Metaphysician say were we to ask him for any other demonstration of Mind than its manifestations; or the mechanical or chemical Philosopher, should we demand any other evidence of gravitation, magnetism, chemical affinity, &c., than the effects

which they supply? And do we not distinguish one from the other, and regard them as wholly distinct forces, by the difference in their effects? The proof is clear and demonstrative in all the cases. Where the results of power differ so materially from each other, it is as good a ground of argument, that the phenomena depend upon specific powers or forces in one case as in the other; and if it be "a cloak of ignorance" in either case to *assume* the existence of forces, it must surely appertain to him who attempts an explanation of the phenomena by assuming forces with which such phenomena have no known connection.

The phenomena which different agents, powers, or causes manifest are so unlike each other, that different modes of investigation must be pursued to arrive at a knowledge of each; and the phenomena will be just as conclusive of the nature of one substance or force as of another. A stone, for instance, affects the sight and touch; it appears of a certain shape, size, color, &c., or it is hard or soft; if analyzed, it is found to be composed of several distinct substances, each of which manifest other phenomena; and this is all we know of the nature of a stone. And so of magnetism, electricity, light, heat, and whatever else appertains to the inorganic world. We examine their manifestations, and compare them together, and distinguish different things from each other by the manifestations or phenomena of each. But there are groups of phenomena which have certain general resemblances, and these we arrange into genera or families, as the several earths, metals, gases, &c.; but the specific distinctions always remain, so that by the phenomena peculiar to each species we can always distinguish one from another. Just so in respect to the physical and chemical forces. The means of knowledge are of the same nature in all the cases, and the proof is as good in one case as in another.

Coming to plants and animals, a general survey of their phenomena shows us that they have no other analogies of any importance with the inorganic world than the elements of which they are composed. These are derived from the inorganic kingdom; and here the similitude ends. If we investigate the phenomena analytically, they come upon us in a profusion immeasurably surpassing those of inorganic beings, and without the most remote resemblance. Here, therefore, we apply the same

rule as to inorganic beings; and by the same process of observation, we find in the organic, besides their peculiarities of composition and structure, a great assemblage of functions, all of which are distinguished by an endless variety of phenomena which have no existence in the inorganic; so that we come to learn incomparably more of the force or power of living beings than we can of inorganic things, and the proof is of the same nature in both cases. By the same rule, also, we attain our knowledge of the Soul, and beyond that of Revelation, all that is relative to the Supreme Being; and we distinguish each from all the others, or bring them into relationship, in the same way. But in respect to the Soul, I rest my demonstration upon certain parallel effects resulting from the action of physical causes upon the brain, and employ the phenomena of Mind abstractedly, as merely auxiliary.

Having thus far afforded the advocates of the "New Philosophy" an opportunity of declaring themselves as to the preliminary step—the "Correlation or Equivalence of Physical and Vital Forces," and a consequent rejection of a Vital Force and Soul, let us next advert to some of the great Masters to whom the world is indebted for the Science of Medicine. And in the mean time I may ask, who, of all the writers now engaged in efforts to substitute chemical for Vital Physiology, can hope to survive their own generation? Physiology and Medicine have been built up upon the foundation of a *Vital Principle*, and they alone who have built upon that foundation—they alone who have carried the same spirit of inquiry to the investigation of Mind, have transmitted their writings to the present century. I might begin with Hippocrates, the "Senex Divinus," the founder of the Science, and follow the ages along till we come to their culmination in the profound Vitalists of recent times—Baglivi, Haller, Hunter, Bichat, &c. All these "household gods" of Medical Science might be most effectually summoned, with their reasoning predicated of an observation of Nature, in defense of a specific Vital Principle or Force, for the purpose of showing an unanimity of opinion that the same philosophy is applicable for proving the existence of a Soul as a *substantive*, *self-acting* Principle. If the premises are good for a Vital Force, so are the corresponding facts for a Soul. And this is, evidently enough, the special rea-

son why the Materialist bestows so much labor upon the *forces of matter* in disproof of a Principle of Life, and why, in so doing, he is careful to avoid the phenomena of living beings as distinguished from those of dead matter. None know better than the Materialist that an admission of this ground of reasoning from the unique manifestations of Life to their cause, as practised by him in the case of inorganic matter, at once opens a door for the same process of reasoning as to a self-acting Soul, and for his own expulsion from this new field of ambitious aspirations. Hence the importance which I have given to the question of a Principle of Life as wholly distinct from the properties of unorganized matter.

But there were also those in ages past who devoted their brief day to the degradation of living beings to the condition of inorganic nature, and which leads the illustrious BICHAT to say of them, that—

"Physiology would have made much greater progress if all those who studied it had set aside the notions which are borrowed from the *accessory* sciences, as they are termed. But these sciences are not accessory; they are *wholly strangers* to Physiology, and should be *banished from it wholly*." "To say that Physiology is made up of the physics of animals is to give a very absurd idea of it. As well might we say that Astronomy is the Physiology of the stars."—*General Anatomy*, &c.

And thus the eminent MÜLLER, in his "Physiology," when speaking of the "Vital Principle"—

"*This* RATIONAL *creative force is exerted in every animal strictly in accordance with what the nature of each part requires.*" The fact is truly stated; but it reposes on great laws of organization, not upon intelligence. That such is Müller's view appears from another expression, that—"*The formative or organizing Principle is a creative power, modifying matter blindly and unconsciously.*" Again he says—"The only character that can be possibly compared in organic and inorganic bodies is the mode in which *symmetry* is realized in each." "Whether the Vital Principle is to be regarded as imponderable matter, or a force or energy, is just as uncertain as the same question in reference to several phenomena in physics. Physiology, in this case, is not behind the other natural sciences; for the *properties of this Principle* in the func-

tions of the nerves are nearly as well known as those of light, caloric, and of electricity, in physics." And again—"Without in the remotest degree wishing to *compare* the Vital and Mental Principles with the forces of inorganic matter, we must express our conviction that there is *nothing in the facts of natural science* which argues against the possibility of the existence of an *Immaterial Principle* INDEPENDENT *of matter, though its powers* be manifested in organic bodies."

Even ANDRAL, the restorer of the ancient humoral doctrine of disease, remarks that—"Until it is proved that the forces which, in a living body, interrupt the play of the natural chemical affinities, maintain a proper temperature, and preside over the various actions of Organic and Animal Life, are analogous to those admitted by natural philosophy, *we shall act consistently with the principles* of that philosophy by giving distinct names to these *two kinds* of forces, and employing ourselves in calculating the different laws they obey."—*Pathological Anatomy.*

The foregoing doctrines are derived from distinguished writers of the present century, and they are examples of opinions entertained by all who have contributed to the advancement of medical science. And even they who are most addicted to the physical and chemical views of Life often contradict themselves in their waking hours. Thus we have seen that the eminent Chemist, Baron LIEBIG, is one of the most emphatic opponents of the doctrine of a Vital Principle or Force, and he carries his chemical philosophy to the Soul itself. And yet, when contemplating the phenomena of Life outside of the laboratory, he avows opinions in direct conflict with his materialistic philosophy; and as this is interesting in showing how utterly baseless and speculative the doctrines in materialism are regarded by their projectors, I shall quote this Chief of the school rather extensively. Thus, in his "Organic Chemistry applied to Physiology," we are told that—

"Our notion of Life involves something more than mere reproduction—namely, the idea of an ACTIVE POWER, exercised by virtue of a definite form, and production and generation in a definite form. The production of organs, the co-operation of a system of organs, and their power not only to produce their component parts from the food presented to them, but to generate themselves in their original form and with their properties, *are*

characters belonging exclusively to Organic Life, and constitute a form of reproduction INDEPENDENT OF CHEMICAL FORCES. This VITAL PRINCIPLE is known to us through the peculiar form of its instruments—that is, through the organs in which it *resides*. ITS LAWS must be investigated just as we investigate THOSE OF THE OTHER FORCES WHICH EFFECT MOTION AND CHANGES IN MATTER."

The following is the very first paragraph in our Author's work on "Animal Chemistry applied to Physiology and Pathology." Thus—

"In the *animal ovum*, as well as in *the seed of a plant*, we recognize A CERTAIN REMARKARLE FORCE, THE SOURCE OF GROWTH, or increase in the mass, and of reproduction, or of supply of the matter consumed—A FORCE IN A STATE OF REST. By the action of external influences, by impregnation, by the presence of air and moisture, the condition of STATIC EQUILIBRIUM of this force is disturbed. ENTERING INTO A STATE OF MOTION OR ACTIVITY, *it exhibits itself in the production of a series of forms*, which, although occasionally bounded by right lines, are yet *widely distinct* from geometrical forms, such as we observe in *crystallized* minerals. This Force is called the VITAL FORCE, *vis vitæ*, or VITALITY."

Farther on we learn that—"The Vital Force is manifested in form of RESISTANCE, inasmuch as by its presence in the living tissues *their elements acquire the power of withstanding the disturbance and change in their form* and COMPOSITION which external agencies tend to produce—A POWER which, AS CHEMICAL COMPOUNDS, THEY DO NOT POSSESS." "The VITAL PRINCIPLE must be a MOTIVE POWER, *capable of imparting motion to atoms at rest*, and of OPPOSING RESISTANCE TO OTHER FORCES producing motion, such as the CHEMICAL FORCE, HEAT, and ELECTRICITY." "EVERY THING in the organism goes on under the influence of the VITAL FORCE, AN IMMATERIAL AGENT which the Chemist can not employ at will." Again he says—

"In what form or in what manner the Vital Force produces mechanical effects in the animal body is altogether unknown, and is as little to be ascertained by experiment as the connection of *chemical* action with the phenomena of motion, which we can produce with the galvanic battery. So it is with the VITAL

PRINCIPLE and with the PHENOMENA exhibited by living bodies. The cause of THESE PHENOMENA IS NOT CHEMICAL FORCE; it is not ELECTRICITY or magnetism. It is A PECULIAR FORCE, *because it exhibits* MANIFESTATIONS *which are formed* BY NO OTHER KNOWN FORCES." "In regard to the NATURE AND ESSENCE of the Vital Force, we can *hardly deceive ourselves* when we reflect that it behaves, IN ALL ITS MANIFESTATIONS, exactly like OTHER natural forces, and *is subject to the action of a* BLISTER." And again—

"The VITAL PRINCIPLE OPPOSES to the continual action of the atmospheric moisture and temperature upon the organism, A RESISTANCE which is in a degree *invincible*." "The VITAL FORCE appears as a MOVING FORCE or cause of motion, when it OVERCOMES the CHEMICAL FORCE, cohesion and AFFINITY, which act between the constituents of food, and when IT CHANGES the position or place in which the ELEMENTS occur. The VITAL PRINCIPLE is manifested as A CAUSE OF MOTION IN OVERCOMING THE CHEMICAL ATTRACTION of the constituents of food, and is, farther, THE CAUSE WHICH COMPELS them to combine in new arrangements, and to assume new forms." Again—"When a chemical compound of simple constitution is introduced into the stomach, its CHEMICAL ACTION is, *of course*, OPPOSED BY THE VITAL PRINCIPLE. The results produced depend upon the strength of their *respective actions*." Again—"The VITAL FORCE in a living animal tissue appears as A CAUSE of growth in the mass, and of RESISTANCE to those external agencies which tend to ALTER the form, structure, and COMPOSITION of the substance of the tissue in which *the vital energy resides*." And as to Plants, our high Authority says that—

"The living part of a plant acquires the whole force and direction of its VITAL ENERGY from the absence of all conductors of force. By *this means* the *leaf* is enabled to overcome the *strongest chemical attractions*, to DECOMPOSE CARBONIC ACID, and to ASSIMILATE THE ELEMENTS of its nourishment."—"The CONSTITUENTS of VEGETABLE and animal substances *are formed under the guidance and power* of THE VITAL PRINCIPLE, which *determines* the direction of their *molecular* attraction. In the formation of vegetable and animal substances THE VITAL PRINCIPLE *opposes, as a* FORCE OF RESISTANCE, *the action of the* OTHER FORCES."—"The

VITAL PRINCIPLE ALONE is capable of restoring the original order and manner of the MOLECULAR ARRANGEMENT in the smallest particles of albumen."—"VITAL POWER in vegetables accomplishes the TRANSFORMATION OF MINERAL substances into an organism endowed with life." Summarily—

"If we assume ALL THE PHENOMENA exhibited by the organism of PLANTS AND ANIMALS are to be ascribed to A PECULIAR CAUSE, *different in its* MANIFESTATIONS from ALL OTHER CAUSES which produce MOTION or CHANGE OF CONDITION; if, therefore, we regard the VITAL PRINCIPLE as an INDEPENDENT FORCE, then, in the *phenomena of organic life*, as in all other phenomena ascribed to the action of forces, we have the *statics*—that is, the state of equilibrium determined by a RESISTANCE, and the DYNAMICS of the VITAL FORCE."!! The Vital Principle *dies*, as follows—

"Death is the condition in which *all resistance on the part of* THE VITAL FORCE *entirely ceases*. So long as this condition is not established, the living tissues continue to offer resistance."

The foregoing extracts are derived from Liebig's renowned work on "Animal or Organic Chemistry applied to Physiology and Pathology," written at the request of the British Association for the Advancement of Science, and which, as the reader will have observed, inculcate the extreme doctrines of a Vital Principle. But the object of the work was to establish the *Chemical* doctrines of Life, in direct opposition to the *Vital*, and it therefore abounds with the most unexampled contradictions in fundamental principles, as the Author happened to be reasoning from the phenomena of living beings or the phenomena of chemical manipulations. Nevertheless, the powerful Materialistic School seized upon his physical and chemical doctrines in total neglect of the counter-poison by which they are accompanied, and have laid them at the foundation of the "New Philosophy." But as it is the most remarkable instance that can be adduced in which a writer, whatever his subject, so contradicts himself, it will be sufficiently obvious to the reader that *Materialism* has made a blunder in taking his chemical dogmas as its guide. I have already presented examples of our Author's chemical philosophy of Life; but that the reader may have immediately before him the remarkable contrast, I will now quote the following statement, in which the two conflicting doctrines are mixed up

together, and a foundation laid for the creation of living beings in the laboratory. Thus—

"By CHEMICAL AGENCY we can produce the CONSTITUENTS of muscular fibre, skin, and hair."!! "We are able to form, in our laboratories, formic acid and urea, &c.—all products, IT IS SAID, of the VITAL PRINCIPLE. We see, therefore, that this MYSTERIOUS VITAL PRINCIPLE CAN BE REPLACED BY THE CHEMICAL FORCES."!!—*Organic Chemistry*, &c.

It will be also interesting to learn our Author's chemical doctrine of Death as opposed to the foregoing vital one; from which it will be seen that, in this acceptation, we die *by breathing*. Thus he says—"The TRUE CAUSE OF DEATH IS THE RESPIRATORY PROCESS [!]—that is, the chemical action of the atmosphere."—*Animal Chemistry*, &c.

I may now finally add, from Liebig's "Chemical Letters," a rebuke of the Vitalists which recoils with great force upon himself. Thus—

"Therefore *ignorant* Physicians present us with impossible theories, and furnish themselves, in the word VITAL POWER, with a wonderful thing, by which they explain *all those phenomena* which they do not understand. With a certain inconceivable, indefinite something, every thing may be explained that is incomprehensible."

BUCHNER, in his work on "Force and Matter," has the sagacity to see that the Materialists, in adopting Liebig as their Leader, have taken in hand "a weapon that cuts both ways;" and among his lively assaults upon the Baron's advocacy of a Vital Principle, he is disposed to consider him, as it respects that subject—"A mere Amateur and Promenader."—*Preface to 4th Ed.* It is the same, however, with all who attempt to apply the doctrines of Chemistry to the problems of Organic Life. They are, in this field of Science, "mere amateurs and promenaders." The moment they approach the subject they summon to their aid either a Vital Principle, or transmute *caloric* into its equivalent, and call it a "Vital Force." There is not, indeed, in the whole range of *medical* literature, one author, however devoted to the physical and chemical views of Life, who does not evince the necessity of admitting a governing Vital Principle as a distinct entity, distinct from all other things in nature. I say, there can not

be produced one author of any consideration in medicine, and scarcely one in Chemistry, who does not summon to the aid of his discussion a Vital Principle whenever he touches upon the abstract phenomena of Life. And equally so in respect to the Mind. They must have, and they know it, a special Force for the Organic mechanism, and a special Principle for the phenomena of Mind. Nevertheless, no regard is shown by them, in their pursuit of the materialistic hypotheses, to those special manifestations of Life and Mind which distinguish them so totally from the conditions of lifeless matter; and I shall now present the reader with an example in which this is avowed, from the "Chemistry of Animal and Vegetable Physiology" by the eminent MÜLDER, of the University of Utrecht, in which he concedes the whole principle of "ascending from the phenomena to their causes." And yet, in his devotion to Chemistry, he is apparently unconscious that living beings are distinguished from dead matter by any peculiar manifestations, or is indisposed to "ascend from an unprejudiced consideration of their phenomena." Thus our Author—

"Wherever forces are found in organic nature, there are substances which are all supplied with *molecular chemical forces.* NO GENERAL, NO VITAL FORCE, should be assumed as the source of those molecular forces. Such a Vital Force is irreconcilable with the true principles of Science, which require that nothing should be *assumed* as existing, but that every thing should be *sought for* in nature; which teach us *to ascend only from an unprejudiced consideration of the phenomena* to their causes, and to assign those *causes only as we deduce them from the observed phenomena.*" And yet within a few pages of the foregoing quotation, after the manner of all other chemical physiologists, he contradicts himself, as follows:

"Every thing which ceases to be subject to THE VITAL PRINCIPLE becomes incapable of being stimulated by the VITAL FORCES;—it is placed in other circumstances; and, as the products of the Vital Functions are different from the products of inorganic nature, in consequence of the very difference of the circumstances in which the elements are placed, so the products of substances deprived of VITAL INFLUENCE must also GREATLY VARY with circumstances"—which is a sound vital doctrine.

And here is another Chemist of distinguished ability, Dr. PROUT, who had the philosophical acumen to place phenomena and their causes in their proper relation. Thus, in his "*Bridgewater Treatise* on Chemistry and Digestion" (1834), he remarks that—

"With the living, the animative properties of organic bodies, *Chemistry has not the smallest alliance, and probably will never*, IN ANY DEGREE, *elucidate those properties. The phenomena of Life* are not even REMOTELY ANALOGOUS to any thing we know in chemistry *as exhibited among inorganic agents.*" "The MEANS by which the peculiarities of *composition* and *structure* are produced, which is so remarkable in all organic substances, like the RESULTS themselves, are QUITE PECULIAR, and bear little or no resemblance to *any artificial process of Chemistry.*" "Those who have attempted to apply Chemistry to Physiology and Pathology HAVE SPLIT ON A FATAL ROCK by hastily assuming that what they found by experiment to be wanting, or otherwise changed, in the animal economy, was the cause of particular diseases, and that such diseases were to be cured by supplying, and adjusting artificially, the principle in error. But the scientific Physician will soon discover that Nature will not allow the Chemist to officiate as her journeyman, even in *the most trifling degree.*"

And to the same effect may be quoted Dr. CARPENTER, one of the foremost, as we have seen, in the Physiological School of pure Chemistry—

"*The agency of* VITALITY," says this reasoner, in his "Comparative Physiology," where he generally ridicules the term and all that is relative to it—"*the agency of* VITALITY, as Dr. Prout justly remarks, does not change the properties of the elements, but simply COMBINES THE ELEMENTS *in modes which we can not imitate.*" !! (*Vide* p. 144.)

Such admissions as we have now seen, coming from the most able of the chemical school of Physiology, are important in connection with its efforts to identify the forces of organic and inorganic nature. But the facts and the laws which they underlie must determine the merits of the subject; although it will be impossible in a work like this to afford the reader more than a general apprehension of the vast amount of facts which may be summoned to the refutation of the foregoing doctrine of the "Correlation or Unity of the Physical and Vital Forces." This, how-

ever, I shall continue to provide in the progress of the work. I may say, also, that, besides what I have presented specifically upon the subject in the *Institutes of Medicine*, there is in that work an array of facts and arguments against the assumed identity of the Vital Force and those of physics and chemistry, or their conversion into each other, throughout the discussion on Animal Heat, in all upon the Composition and Structure of living beings, all upon the Properties of Life, all upon the Nervous Power and Laws of the Nervous System, all upon Organic and Animal Functions, all upon the principles relative to Pathology and Therapeutics, all upon the Modus Operandi of Remedies; and, in brief, the whole work, of more than one thousand octavo pages, is a demonstration against the doctrine, although not of the same direct nature as has now been submitted to the reader. Equally, also, do all the facts and arguments concur together in proving, inferentially, that Mind is as distinct from all the forces of nature as they are from the Creator; and thus I bring the whole into co-operation with the present more specific demonstration in substantiating the existence of the Soul as a *substantive self-acting Agent.* In a notice of the "*Institutes of Medicine*," in the British and Foreign Medico-Chirurgical Review, July, 1869, it is said that—

"Dr. Paine puts himself in opposition to men whom we are accustomed to consider the first of the day, to say nothing of such humble individuals as ourselves. We need hardly state after this that Dr. Paine is strenuously opposed to what *we are accustomed to consider the grandest generalization of modern times*—the *Correlation of Forces, the Conservation of Energy.* Still, the perusal of such a book as that written by Dr. Paine is not without its advantages; *it shows, at least, that there are two sides to a question;* and no one can deny the ability and the energy with which Dr. Paine maintains his position." (The *italics*, as usual, are mine.)

While I am much obliged to the Reviewer for his candor, I have made the foregoing extract particularly for the purpose of enabling the reader to comprehend fully the prevalence of the doctrine under consideration, and the support it has derived from the Scientific World; and I may therefore desist from farther citations from authors who have treated upon the subject.

CHAPTER VII.

OTHER AND MORE DIRECT FACTS AND ARGUMENTS IN MATERIALISM, AND OTHER RELATIVE GROUNDS CONSIDERED. — ORGANIC LIFE.—CREATION.—SPONTANEOUS GENERATION.—DARWINISM, ETC.

I HEARTILY agree with Sir JOHN HERSCHELL, that—

"Nothing can be more unfounded than the objection which has been taken, *in limine*, by persons well-meaning, perhaps, certainly narrow-minded, against the study of Natural Philosophy, and, indeed, against all science, that it fosters in its cultivators an undue and overweening self-conceit, leads them to doubt the immortality of the Soul, and to scoff at Revealed Religion."—*Discourse on Natural Philosophy.*

I shall have sufficiently indicated the true origin of the prejudice in the foregoing paragraph. Perhaps, indeed, the illustrious Astronomer whom I have just quoted may have unconsciously contributed his mite towards the result in denominating "the *first appearance* of Organic Life on our globe *that mystery of mysteries*"—a sentiment which is quoted in MANTEL'S *Wonders of Geology*, and by other geologists, with no little complacency. It is not "Natural Philosophy," or "Science," *per se*, which forms the ground of objection to "the study of natural philosophy," but a false interpretation of Nature. It is this which has adulterated our faith, and incurred rebuke; and I shall have presented many startling examples where this obliquity of vision has more or less justified the prejudice in unreflecting minds.

On the contrary, it is the natural tendency of all true philosophy, of every intellectual improvement, of every species of knowledge, to enlarge our conceptions of the Deity, and to warm our gratitude and piety. It is, indeed, a principal object of my present undertaking, in its connections with the Soul, to show that philosophy and science may be brought powerfully to the protection and interpretation of the Holy Scriptures, and may be

made to prostrate those errors which are arrayed in opposition. It is also for the preservation of that philosophy which our opponents so justly glorify that I have again appeared as its humble defender. But I insist that it is in no respect my object to speak of persons or motives, but of the doctrines which they inculcate. If they are imbued with error, I shall not hesitate to render it manifest, and in language corresponding with its nature; nor will it be objected that, to be properly intelligible, things should be called by their right names. As to epithets, they are nothing unless they flow naturally from the premises. An Author may reject the Mosaic Narratives in good faith, and yet maintain his general confidence in Revelation; he may deny the existence of the Soul for reasons entirely satisfactory to himself; he may gravely imagine that organic beings originated in the forces of inorganic nature, or in some primordial form of organic matter; and he may think that he has a right to inflict those opinions upon a credulous world. But this in no wise exempts him from a criticism that may expose the errors of his doctrines and their tendency to unsettle all Religion in the masses of society. Whatever, however, may be the critic's judgment, his Author is certain of a full measure of justice from the unprejudiced public to whom the appeal is made. I will also repeat that, wherever words which occur in the quotations are placed in capitals or italics, and apparently operate to my advantage, it is my desire that the emphasis should be regarded as mine. In a large proportion of cases it is made by myself, to engage the reader's attention.

Having gone over the ground of the "New Philosophy," designated as the "Correlation, or Equivalence, or Metamorphosis, and Conservation of Forces," and the manner in which it is applied to the interpretation of Life and of Mind, I shall now enter more fully upon a consideration of the details of the materialistic doctrine. In the fulfillment of this purpose I shall continue to afford materialism every possible advantage, so far, at least, as a citation of the highest authorities in its behalf can be arrayed in opposition to my facts and arguments. There can be no evasion of the questions before us, and the force against which I contend should be fully presented to the reader.

The only novelty, however, of the "New Philosophy" consists in the application of the doctrine of the "Correlation or Equiva-

lence and Conservation of Forces." To BUFFON is due the merit of having projected the essential features of the present doctrine of the spontaneity of living beings, whether they begin with the elements of matter, or "protoplasm," or a "cell," or any other "primordial form." Buffon is quoted by HOWARD, in his "History of Mankind" (1797), as saying that—

"All organized nature, plants, all animals, and man, owe their *primary* existence to an infinity of living organic atoms, or molecules, everywhere floating, and to certain inferior forms, or matrixes (*moules intérieures*), ready to receive and adopt them. If these produce not new organized beings, it is *because there is already a sufficient number* of existing beings to receive and absorb them. All production, all generation, all development and growth suppose the concourse and reunion of a great quantity of these organical atoms. They animate all organized bodies, and are successively employed for the nourishment and generation of all beings. Should a great part of these beings be *suddenly suppressed, we should see new species appear*, because these organical atoms, indestructible and ever active, would in that case reunite to compose other organized bodies; but when entirely absorbed by the inferior forms of already existing beings, *no new species can be formed*, at least in the first great classes of nature."—Howard then adds—"In the formation of man, doubtless NOT TO SHOCK TOO VIOLENTLY VULGAR PREJUDICES, Buffon allows a particular interference of the Divinity, who imparted to him that intelligent spirit which renders him so superior to other animals. He *insinuates*, however, that, *from analogy, this might be dispensed with*, and that with respect to his *body the common law of animal development was followed.*"

Those disciples of nature who do not begin with the elements of matter, but with protoplasm, or a cell, or other primordial forms, have neglected Buffon's provision as to the origin of those more advanced rudiments, and either assume their eternal existence, as taught by Spencer, or candidly avow their ignorance of the manner in which they get into being. Of the latter class are Darwin, and the late eminent Professor Tiedemann, who, in his very able work on the "Physiology of Man," has laid the *substratum*, as it were, of the Darwinian hypothesis, and, of course, of *materialism* also. Thus—

"The most probable hypothesis is, that the *substance* of organic bodies existed primitively in water, as a matter of particular kind, and that it was *there endowed with the plastic faculty*—that is to say, with the power of acquiring by degrees different simple forms of living bodies, with the concurrence of the general influences of light, heat, and perhaps, also, of electricity, &c., and of *then passing from the simple forms to others more complicated;* varying in proportion to the modification occurring in the external influences, until the point when each species acquired duration by the production and manifestation of activity of the generative system."—"Although we can not here answer the question, *whence* came the *water* and the *organic matter* which it contained, yet this hypothesis is the one which accords best with *the facts with which geology has lately been enriched.*" And again he reiterates—"If it be asked, *whence organic matters proceed*, how they are produced, together with *the power of formation inherent in them*, we are necessitated candidly to confess our ignorance on the subject, inasmuch as *the first origin* of organic matters and living bodies is altogether *beyond the range of experiment.*"

And now I ask, Does not the Organic Chemist attempt or profess to create organic compounds? So says Liebig, and so say most other distinguished Chemists. Liebig and his disciples create the *compounds;* Crosse and his followers create the *animal.* Others do but make the attempt; and this is a very numerous class who thus enter into competition with the ORIGINAL AUTHOR of organic compounds. What, therefore, is the difference in principle between him who pretends to have succeeded in this work of creation, and the other who has attempted the work, but without success?

The foregoing doctrine, or its equivalent, is vigorously sustained by many of the leading scientific minds in Europe, where it is advocated by such philosophers as Louis Büchner, Carl Vogt, Rudolf Virchow, Jacob Moleschott, in Germany, and in England by such eminent writers as Herbert Spencer, T. H. Huxley, Joseph D. Hooker, John Tyndall, William B. Carpenter, Henry Maudsley, &c. It is also now making its appearance in these United States as an attractive subject for popular lectures.

My attention will be mostly given to the present representa-

tive Minds of Great Britain, to which Nation we are indebted for a stupendous amount of the soundest philosophy and knowledge in the past generations. Whom now do we see there but the leading Members of the British Scientific Association, and others not less distinguished in the walks of Science, arrayed in a solid Phalanx against the existence of the Soul, and therefore, of necessity, against man's immortality. This may not be distinctly avowed, but we shall see that it is so inferentially; for I shall quote several writers freely, as I concur entirely with the Editor of the Yale College edition of Professor Huxley's Lecture on the "Physical Basis of Life," that the new doctrines should "have a candid hearing"—whatever may be our motives. The Eastern horizon is dark with clouds of the most portentous omen. The New York DAILY TRIBUNE, of Oct. 22, 1869, in an able and liberal Review of the Rev. Dr. J. P. THOMPSON'S "Man in Genesis and Geology," thus sounds the alarm—

"When at length the tremendous current of skepticism and atheism reaches us from ENGLAND—as it is sure to do in a few years—our religious guides will be utterly unfitted to meet it, and we shall repeat the desolate experience of modern Germany in the matter of Faith and Science."

And thus the New York EVENING POST (March, 1868), in an able summary of BÜCHNER'S work on "Force and Matter"—"Suffice it to say that the necessary tendency of these principles is to uproot every thing that is established. They recognize no right among men but the right of the strongest; no law but the law of passion and impulse. If such views became general, the Church and all its observances would first disappear. Parental authority and the marriage relation must soon follow. And how long could civil order, or, indeed, any tolerable form of human society, remain?"

It is an auspicious omen that our ablest Dailies are arrayed against the efforts that are everywhere made to render the doctrines of materialism and infidelity "accessible to the people at large." These missives, thus freighted, and bearing the editorial stamp of a disinterested interposition in behalf of the popular mind, are of the most incalculable importance to morality and religion, as they are the only medium of reaching the general community.

Per contra—which must have escaped the POST—for notwithstanding the severity of Büchner's critics in Germany, he expressly declares, in the work reviewed by the POST, that—"Since the general results of Philosophy and of the Natural Sciences *have become accessible to the people at large*, the greatest dangers to society have been apprehended from their *materialistic* tendencies. They have even predicted the downfall of Society, and a *bellum omnium contra omnes*, if such tendencies should become prevalent. Only *complete ignorance of the springs of Society* could fear such a catastrophe."

Büchner is intolerant of opposition. Among his annoyances he brings forward, in great indignation, the eminent Professor RUDOLPH WAGNER, as exclaiming, at a meeting of German physicians at Gottingen, that—"The morality which flows from *scientific* materialism may be comprehended within these few words —'Let us eat and drink, for to-morrow we die.' All noble thoughts are but vain dreams, the effusions of automata with two arms, running about on two legs, which, being finally decomposed into chemical atoms, combine themselves anew, resembling the dance of lunatics in a mad-house."

However ludicrous the portrait, it is admirable, nevertheless. If it appear like a caricature, it is drawn in exact conformity with the teachings of the "New Philosophy." Nay, more—it is vastly more to the truth than the complainant's comparison of man to a "steam-engine;" for, as will be seen in the sequel, Büchner affirms that the engine has even about as much of a "heart," and of "life," as a human being, and, in conformity also with the "New Philosophy," that the latter is moved by no other *force*, vital or intellectual, than the engine itself; which must be allowed to be quite as ludicrous as Wagner's personification of the doctrines of the so-called "modern science."

Dr. CARPENTER, whose application of the "Correlation or Metamorphosis of Forces" has been already before us, tells us, among other similar expounders of Life, how Tiedemann's organic matter and Darwin's primordial form came into existence; being essentially the doctrine propounded by Buffon more than a century ago (p. 175). In the first place, after advocating the existence of *vital properties in the elements of matter*, and saying that —"No one can ASSERT *that there does not exist in every uncombined*

particle of matter which is capable of being assimilated *the ability to exhibit vital actions*, when placed in the requisite conditions," he remarks that—"There is no reasonable ground for doubt that, if the elements could be brought together in their requisite states and proportions *by the hand of man*, the result (artificial organic compound) would be the same as the *natural* compound." Again —"That the *germs* (of parasitic plants and animals in the interior of others) have been conveyed *from without* into the situations where they are developed, must be held as *a very forced supposition*."!!

And again he says—"Reason has been already given for the belief that the affinities which hold together the elementary particles of *organized* structures are not different from those concerned in the *inorganic* world; and it has been shown that the tendency to DECOMPOSITION AFTER DEATH BEARS A VERY CLOSE RELATION WITH THE ACTIVITY OF THE CHANGES WHICH TAKE PLACE in the part during life;" and then, near to the same page, contradicts himself, as follows:

"Organization and *vital properties* are simultaneously communicated to the germ by the structures of its parent. THOSE VITAL PROPERTIES confer upon it THE MEANS of itself assimilating, and THEREBY ORGANIZING AND ENDOWING WITH VITALITY, *the materials supplied by the inorganic world*."—*Principles of General and Comparative Physiology.*

The eminent Professor MÜLDER belongs to the School that advocates the doctrine just quoted from Dr. Carpenter, affirming that—"Organic substances possess properties of a peculiar kind, existing in the *four elements*, *carbon*, *hydrogen*, *oxygen*, and *nitrogen*, of which they are all constituted," and that "upon these principles *no reason is left* for the dispute about *equivocal generation* or *spontaneity of being*." Indeed, like Drs. Carpenter, Pritchard, &c., before the advent of the doctrine of "Correlation or Equivalence of Forces," Mülder promulgated, in his "Chemistry of Animal and Vegetable Physiology," the whole materialistic hypothesis as it reposes upon the doctrine of "Correlation of Forces;" nor has it undergone any modifications in principle at the hands of any of those who have endeavored to fortify it by a more formal exposition of the Equivalence of Forces.

The foregoing are only introductory examples of the groundwork of the discussion which lies before us; as it will be seen

that they who reject a Vital Force generally refer the origin of living beings to a conjoint action of the chemical and physical forces in aggregating the elements of matter into organic compounds. The doctrine necessarily is, and is so avowed, not only thoroughly materialistic as to Life and the Soul, but rejects also Creative Power; which is *practically* shown by Crosse and his followers, who profess to create animals by the action of electricity upon simple mineral substances, as exemplified by the *Acarus Crossii*, and of which the Author of the celebrated work on the "*Vestiges of the Natural History of Creation*" remarks that—

"On the hypothesis here brought forward, the ACARUS CROSSII [!] was a type of being ordained from the beginning, and destined to be realized under certain physical conditions. When a HUMAN HAND brought these conditions into the proper arrangement, it did an *act akin to hundreds* of familiar ones which we execute every day, and which are followed by natural results, but it did *nothing more*." "The utmost that can be claimed for or imputed to Crosse is, that he arranged the natural conditions under which the true creative energy, that of the Divine Author of all things, was pleased to work in this instance."

Here we have an exemplification of a strictly atheistical expedient, in the attempt to assign the existence of organic beings to the merest chance, under the pretext of ascribing to that chance the intrinsic attributes of a Creative Power, and the imposing title of the "Divine Author of all things."!! It is the same with each and all who allow a God, a Creator, &c., yet reject entirely His Revelation as to Creation, supported as it is by the most consummate and endless designs—besides some other demonstrative facts which will appear in the sequel. It is the old expedient of the wolf in the disguise of the sheep. The Author was a pioneer in the "New Philosophy;" and although boldly explicit, he had the public pulse to feel. He suppressed his name, and scattered his weapons in ambush. He enters extensively upon the origin of living beings, but it simply amounts to the assumption that it is an established fact, that by a law of nature the elements of matter organized themselves into animated beings. No work of this character has had a greater popularity. It was eminently calculated by its startling assumptions, and being of a popular design, to delight the imagination and under-

mine the biblical faith of multitudes. This was easily foreseen; and as it struck at the foundation of Physiology as well as Religion, and as its unphilosophical and mischievous doctrines were urged upon us even by the most responsible medical writers, it engaged my attention at the time of writing the first edition of the *Institutes of Medicine* (1847), from which I shall now make a few extracts. I have there said that—"The *Vestiges of the Natural History of Creation* is powerfully sustained by able articles in the BRITISH AND FOREIGN MEDICAL REVIEW for January, 1845, consisting of twenty-six pages of eulogistic remarks; and in the MEDICO-CHIRURGICAL REVIEW for the same month, of ten pages not less congratulatory—both of *London*. The work was published in 1844; and, although not at all relevant to medicine, it was taken up with avidity by those two leading medical journals of Europe, and an effort made to prepossess the medical profession before the work itself should fall under their observation; adopting in this respect the system which was almost universally pursued by the periodical press, professional and unprofessional, even in anticipation of LIEBIG'S work on *Animal Chemistry applied to Physiology*, &c."

I then proceeded to say that—"It is now my purpose to quote the foregoing Reviews in connection with the 'Vestiges of Creation,' partly to supply other examples in justification of what I have said in behalf of the Profession, and of the tendency of the chemical and physical hypotheses of life and disease to lay the foundation of a grosser materialism, and of infidelity in Religion. It seems peculiarly appropriate that Reviewers, who wield an extensive and powerful sway, and whose occupation it is to defame whatever molests that domain, should be used for the contemplated purpose, and this more especially, as both Reviewers offer defiance to the 'Saints,' and the 'timid Religionists.' The Reviews are conducted with great diligence and research. Their influence is coextensive with medicine. That influence must be sapped by a display of its tendencies. There can be no difficulty with a defense of the right. The inculpated are able, their means ample, their coadjutors numerous and powerful, the public generous, and, as I said on a like occasion in the *Medical and Physiological Commentaries*, 'I am single-handed, and have nothing but facts for my weapons.'

"There can be no place more appropriate for looking 'through Nature up to Nature's God' than in the general survey of organic beings. If ordained in their organization and their laws by a higher Power, that organization and those laws may be well urged in proof of their Origin. Then, too, shall the minister of health realize the importance of the Institutes of Medicine, and the Hippocratic maxim, that 'a philosophical physician is like a god.'

"I shall quote a passage of general import from each of the foregoing Reviews, that no doubt may linger upon the mind of any reader as to the justice of the criticism which I have now exercised in behalf of religion, morality, and the dignity of medicine. The *emphasis* is mine. And first the elder brother; beginning thus—

"'This is a remarkable volume, small in compass, but embracing a wide range of inquiry, from worlds beyond the visible starry firmament, to the minutest structures of man and animals. *No name is prefixed*—perhaps in order to avoid the snarls of the narrow-minded and bigoted SAINTS of the present day,' &c.

"The middle, thus—'For how many *millions and millions of years* this production and reproduction of animals went on before man made his appearance on the scene, no human being will ever know. [!] In all probability, *countless ages* must have elapsed before this masterpiece of creation appeared. Our Author's speculations on the HOW, the WHY, the WHEN, and the WHEREFORE this great event occurred, will not give satisfaction to the *present* RACE of mankind. [!] His hypothesis is three or four centuries *in advance of the* TIMES, and will be stigmatized by the modern SAINTS as *downright atheism*,' &c.

"And the end, thus—'We have dedicated a space to this remarkable work that may induce many of our readers to peruse the original. The Author is decidedly a man of great information and reflection. He will have a host of SAINTS in array against him, and many will join in the cry *from* HYPOCRISY *and* SELF-INTEREST. As we said before, his doctrines have come out a century before their time.'"—MEDICO-CHIRURGICAL REVIEW, *London*, January, 1846.

"Next, Dr. FORBES (afterwards Sir JOHN), in the *British and Foreign Medical Review*—

"'This is a *very beautiful* and a *very interesting* book. Its theme is one of the grandest that can occupy human thought—no less than the CREATION OF THE UNIVERSE.' 'We are also influenced by the abstract desire to place before our readers matter for their contemplation which can not fail at once to *elevate*, to *gratify*, and to *enrich* the mind. It has always been one of the boasts of our noble profession that it touches and blends with every science; and we should be sorry that our humble efforts should at any time be wanting to stimulate its professors to exertions that might still justify the boast.'!!

"Of Laplace's nebular hypothesis he says—'So far from admitting the *atheistical* tendency which TIMID RELIGIONISTS have attributed to the *nebular hypothesis*, *we consider it the grandest contribution which Science has yet made to Religion*,' &c.

"The reader, therefore, will have no difficulty in understanding the 'conventional' nature of certain phrases in the following remarks by Dr. Forbes:

"'That the Creator formed man out of the dust of the earth, we have *Scriptural* authority for believing, and we must confess *our own predilection* for the idea that, at a period however remotely antecedent, the Creator endowed certain forms of *inorganic* matter with the PROPERTIES REQUISITE TO ENABLE THEM TO COMBINE, AT A FITTING SEASON, INTO THE HUMAN ORGANISM, over that which would lead us to regard the great-grandfather of our common progenitor as a chimpanzee or an orang-outang.'

"The *Vestiges of Creation* is then quoted by the Review, as follows: 'We have seen powerful evidence that the construction of this globe and its associates, and, inferentially, that of all other globes of space, was the result, not of any immediate or personal exertion of the Deity, but of NATURAL LAWS which are expressions of His will. What is to hinder our supposing that the ORGANIC CREATION is also a result of NATURAL LAWS which are, in like manner, an expression of His Will?'

"Upon the foregoing extract from the *Vestiges*, which is a part of a more extended one of the same nature, the Review remarks that—

"'The COMPLETE ACCORDANCE OF THESE VIEWS with those some time ago PROPOUNDED BY OURSELVES (vol. v., p. 342), must be evident, we think, to our readers. To the objection

which some TIMID RELIGIONISTS may urge against them, that they are inconsistent with the MOSAIC RECORD, we simply reply with our Author, that we do not think it right TO ADDUCE THAT RECORD, either IN SUPPORT OF, or IN OBJECTION TO, *any scientific hypothesis* based upon the phenomena of nature.'"—BRITISH AND FOREIGN MEDICAL REVIEW, *London*, January, 1846.

"Dr. FORBES assumes, of course, that all the misapprehensions and perversions of 'the phenomena of nature' are paramount to any thing declared in the Mosaic Record."

Let us now proceed to other authorities upon the question before us. Professor Liebig, in his work on "Animal Chemistry applied to Physiology and Pathology," which has served so extensively as a foundation for the "New Materialism," states the doctrine in the following summary manner:

"Physiology has sufficiently *decisive grounds* for the opinion that every thought, every sensation, is accompanied *by a change in the composition of the substance of the brain;* that every motion, every manifestation of force, IS THE RESULT *of a transformation* of the structure or of its substance." "Thought, sensation," &c., are "*manifestations* of force," and are, therefore, "the result of," &c.

If, then, the phenomena of Mind be the "result of a transformation of the structure or of the substance" of the brain, then is the brain the *sole cause* of the phenomena; while the true Psychologist maintains that the Soul is the *efficient* cause, acting in some unknown manner through or upon its co-operating organ, the brain.

Few Chemists have appeared who are as able and distinguished as Professor LEHMANN, and his opinion on the questions before us may not be withheld. In his erudite work on "Physiological Chemistry," he has the following remarks:

"We have not hesitated to avow that we have assumed a *thoroughly radical* point of view in reference to specific Vital phenomena and Vital Forces; for we can not rest satisfied with the *mysterious obscurity* in which they have been artificially enveloped."

Our Author then proceeds to designate the Science of Life as a system of *metaphysicology*, and to confound Physiologists with the "*advocates of a romantic poetry of nature;*" though it is true

he had the encouraging success of Liebig before him. Thus our Author—

"It would be well if *these spiritualists* would look down from the high stand they have chosen, and deign to believe that there are some among those experimentalists who, *clinging to matter*, and gathering their facts with ant-like industry from the lowly earth, notwithstanding that they have long held communion with the poet-philosopher, Plato, and the philosophical natural inquirer, Aristotle, and have some familiarity with the Periphrases of Hegel and Schelling, are yet unwilling to relinquish their less elevated position. If these happy admirers of their own Ideal had descended from their airy heights, and closely examined organic and inorganic matter, they would not have deemed it necessary to assume that, besides *carbon*, *hydrogen*, *nitrogen*, and *oxygen*, organic substances must also contain an *organigenium* or latent *vital force*, or whatever else they may please to call it. Had they sought information from a CHEMIST [!], they would have learned that, when exposed to the clear light of rigid logic, THERE IS NO ESSENTIAL DIFFERENCE BETWEEN ORGANIC AND INORGANIC BODIES. A Chemist totally unacquainted with organic matter would, *a priori*, have deduced all these *incidental differences* of matter from the doctrine of affinity and the science of Stoichiometry, evolved from *dead matter*. However these Advocates of a romantic poetry of nature may despise the swarm of industrious investigators, who are often unweariedly occupied for years together in endeavoring to collect a few firm supports for the great edifice of a true philosophy of nature, we do not despair of seeing our work rise in simple grandeur, more durable and lasting than these sophisms of natural philosophy, which, passing through ages, from Pythagoras and Empidocles to Schelling and Hegel, have, like the sand of the ocean shore, been alternately upborne by one wave and ingulfed by the next."

That the foregoing is not a hasty rhapsody appears from a *note*, in which our Author states that he had "expressed similar ideas in an Article which appeared in the *Gegenwart*." At another time, also, he caricatures the doctrine of a Vital Force as "a belief in *supernatural* forces of matter." And yet this able man, who has studied *organic nature* in the *Chemical Laboratory*

alone, has the candor to admit that *very little dependence* can be placed upon *Organic Chemistry*, or its promulgations in respect to living beings.

The doctrine of the existence of vital properties in the elements of matter, and their organizing faculty, of which I have recently spoken, and which was lately only conjectural, is now becoming an important element not only in materialism, but in the spontaneity of living beings. It is thus applied, for example, by HERBERT SPENCER in the First Part of his "Psychology" (1869), where, also, he assimilates inorganic and organic nature, in the following manner:

"The separation between Biology and Geology once seemed impossible, and to many seems so now. But every day brings new reasons for believing that the one group of phenomena *has grown out of the other. Organisms of highly differentiated portions* of the matter forming the *Earth's crust*, and its gaseous envelope, and their differentiation from the rest, has arisen, like other differentiations, *by degrees.* The *chain* between the inorganic and organic is being filled up. On the one hand some *four or five thousand* compounds, *once* regarded as exclusively ORGANIC [!], *have now been produced artificially* from inorganic matter, and Chemists do not doubt their ability to produce the highest forms of organic matter."!!

Such is becoming a common doctrine. A high Authority in Chemistry, W. ADLING, in his lectures on "Animal Chemistry" (London, 1866), affirms that—"In broad antagonism to the doctrines which a few years ago were regarded as indisputable, we now find that the Chemist is capable of producing from *carbonic acid and water* [which have three elements only] *a whole host* of organic bodies; and we see no reason to question his ultimate ability to reproduce *all animal and vegetable principles* whatsoever."

But all this bears no ratio whatever to the creation of the *Acarus Crossii* out of a solution of silex in water; but it shows that the manufacture of organic compounds out of the elements of matter is a predicated result of the doctrine of the "Correlation of Physical and Vital Forces," which is aspiring at the highest forms of organic beings.* It is, however, beyond the ability of

* Dr. BASTIAN supposed that he had succeeded in creating "truly organized plants, and small ciliated infusoria" out of inorganic matter. But more recently it has been

chemistry to identify these simple products of the laboratory with organic compounds. The reasons can not be introduced here; but I have gone extensively over the ground in the *Institutes of Medicine*, particularly under the article on *Composition*, pp. 23–49. In the First Edition (1847), I remarked that we should necessarily expect, from the shades of elementary distinctions, that chemistry would confound, and even *identify*, many organic compounds that are *totally* unlike in their nature. And this it actually does, in presenting to us sugar, vinegar, starch, gum arabic, &c., as chemically the same substance; and in identifying pus and cheese; and again, the albumen of eggs, lymph, mucus, and the product of certain cancerous affections. Nor is there generally any agreement among the Chemists in their analyses of organic compounds. All the elaborations from vegetable substances are of a doubtful nature as it respects their relation to organic and inorganic compounds; and what renders this certain are the alkalescent nature and crystalline structure of quinia, morphia, &c., which are never the conditions of natural organic compounds. Moreover, Chemistry identifies those two perfectly distinct alkaloids both as to the nature and the proportions of their elementary constituents. Indeed, some of these reputedly organic products may be made to undergo an apparently endless variety of transformations; such, for example, being the case with alcohol when subjected to the action of acids throughout its various changes. The moment chemical agencies begin their operations, artificial transformations necessarily ensue, and the nature of the organic compound is changed in a corresponding manner. A large proportion of the resulting products are perfectly new formations. Nor can there be any doubt that the reputed *proximate principles* of plants and animals are intimately incorporated in any given compound, and have no such separate existence as chemistry teaches. It lies at the very basis of chemistry that all the elaborations are the artificial results of affinities that have been set in motion by the agents employed, and which are employed for that very purpose. How much more probable, therefore, that the supposed organic compounds fabricated by the

found that the same organisms spring from atmospheric germs. The attempts to vitalize dead organic and inorganic substances has utterly failed in the skillful laboratories of Schultz and Dalle.

Chemist out of the *elements of matter* have very little relationship to those which are formed in the laboratory of organic nature, and hence how little encouragement the Chemist can take to himself of carrying his Art to the creation of complex animals. It is an absurdity, I say, to suppose that Chemists have created any proper organic compound out of inorganic matter, which they know to be the work of vegetable organisms alone, and which were created for that very purpose. Will any one of the reputed "five thousand" of their manufactured compounds sustain animal life in any of its organisms from the highest to the lowest? They know it will not. And they know also that all truly organic compounds of an animal nature are speedily resolved into their ultimate elements when separated from the living body, while no such result befalls the artificial compounds. It will be admitted, moreover, that without plants for the purpose of creating organic compounds out of the elements of matter, the whole animal kingdom would speedily disappear from the earth. But the supposed organic constitution of the purely artificial productions is too important to the doctrine of the "Correlation of Forces" to be surrendered without a struggle on the part of the Materialists. In that struggle they must encounter the fact that no organic compound has yet appeared as the natural result of the forces and laws of inorganic nature, and that animal organisms are incapable of organizing the simple elements of matter, or those elements in their inorganic combinations. Nothing but plants have ever been known to accomplish this result in a solitary instance; and this is the great function which devolves upon them, and for the manifest purpose of supplying food, either directly or indirectly, to the animal kingdom. If inorganic forces are capable of rendering this service, why has God, or "nature," Who "never does any thing in vain," ordained the vegetable tribes? And what analogy is there between the highly organized structure of plants, their great variety of mechanism, their endowment with life, &c., and the appliances of the Chemist's laboratory? The very interrogatory renders the pretense in the highest degree absurd. Looking, therefore, at Nature alone, the only God of the infidel, I ask him whether it is probable that his favorite nature, which, he concedes, "operates by uniform laws," would have been so inconsistent as to have or-

dained the vegetable tribes for the purpose of organizing the elements of matter for the sustenance of the animal tribes, and at the same time have imposed a similar office upon the elements of matter in virtue of their inherent properties, whatever physical influences may be brought to operate upon them—while at the same time, she has denied to animals the ability which is so lavishly bestowed upon the vegetable world? Moreover, if you can discern no difference between the Force which animates the organic kingdom and the forces of external nature, do not the fundamental distinctions between the *organic structure* of plants and all the supposable conditions of the *elements of matter* under every imaginable influence of the Chemist's laboratory, pronounce the impossibility of effecting, by any artificial process, the compounds which are the work of vegetable organic structure, and then only through an elaborate series of organs which are everywhere distinguished by consummate designs, all working harmoniously for this very result? But try the question as to nourishment for animals. What LIEBIG conceded to nature's laboratory at the sacrifice of his own in 1842, and of his own consistency, will doubtless be as true in 1870, and so remain to the end of time; namely, that—

"THE FIRST SUBSTANCE CAPABLE OF AFFORDING NUTRIMENT TO ANIMALS IS THE LAST PRODUCT OF THE CREATIVE ENERGY OF VEGETABLES."

And here is another of the latest and highest authorities, and who is, like Liebig, deeply interested in the manufacture of something approximating the simplest forms of undoubted organic substances—VIRCHOW, who says that—

"Chemistry has not succeeded in forming a *blastema* [the general formative compound of tissues], nor physics in forming a *cell*. *What* does it matter?"

The eminent writer, Herbert Spencer, whom I have been lately quoting, will reappear in the course of our discussion, when it will be seen more distinctly that the doctrine of "Correlation or Metamorphosis of Forces," and the origin of Life in the forces of the inorganic world, conduct us to a still darker materialism; and that even a beginning of Life may be only hypothetically admitted to advance the sophistry into an eternity of being.

Dr. HENRY MAUDSLEY, to whom I have already referred, is

also one of the latest and ablest British writers upon the subject before us, and he incorporates the doctrine of *materialism* along with that of *progressive development*, as summarily expressed in the following quotation from his work on the "Physiology and Pathology of the Mind" (1867).

"The development of Mind," he says, "both in individuals and through generations, is a *gradual process of organization*—a process in which *nature is undergoing her latest and most consummate development.*"

Of Dr. Maudsley's work there is an able Review in the *British and Foreign Medico-Chirurgical Review* for April, 1868, in which occurs the following summary of Dr. Maudsley's opinion upon the Soul. Thus—

"To summarize the hypotheses advanced—every thing in Mind—every mental operation or result, is referred to *organization*, and no force other than *nervous force* is recognized. Mental phenomena result from the functional activity of nerve-cells called forth by impressions from without and from within, and modified and directed by the residua of impressions, concepts, and ideas heretofore existent. The like mental action exists in varying extent in all animals; it is improvable by hereditary transmission, and some of it is innate. Mind is no individual entity, but an *organic product* of ever variable quantity and quality, modified by surrounding nature and by the circumstances of life, and progressively evolved from the reciprocal action of external objects and events, and of the activity of nerve matter, in such a way that the building up of the Mind is an act of the entire body, with which, indeed, Mind is *conterminous.*"

After numerous quotations from the work, the Review remarks, that—"With this extract we conclude our sketch of the principal doctrines concerning mental physiology advanced by Dr. Maudsley. These doctrines can not be examined and be treated with indifference or contempt by the thoughtful and unprejudiced; although we imagine some will sniff in them *rank materialism*, and scout them as unworthy of discussion."

Here I shall pause in this discussion with materialistic writers, for the purpose of setting forth certain fundamental facts and principles that may be brought to the test of the doctrines already presented, and that such as remain to be considered may

be also subjected by the reader, as the inquiry advances, to the same criterion. Whatever hypothesis may come up in Materialism, or in any project relative to the origin of organic beings, it must take along with it the various facts which I shall have presented as to the organization of animals and plants, and their relations to the inorganic world. These will be seen, in a great variety of respects, to be fatal to every doctrine which denies the original creation of man and animals by a Designing Power, and in a state of full maturity of body and mind. The questions before us will be abundantly settled in the few following pages; but the discussion will be extended far beyond, on account of its important bearing upon materialism, and that the arguments of our ablest opponents may be brought under review.

In the first place, as it is a favorite occupation with Materialists to prove, what all admit, the necessity of matter to force, as it exists in this world, I may here transfer from my *Institutes of Medicine* the following proof of the existence of a Creator and of the creation of matter; and, as it is founded upon the materialistic postulate, it should be acceptable to those who recognize nothing but matter. The *Institutes*, thus—The kingdoms of nature are governed by inherent powers; but the existence of matter, whether organic or inorganic, is also indispensable to their respective forces. These forces, therefore, did not create matter; and since matter can not create matter, and therefore did not create itself, it follows that its associate powers did not create themselves. Whence it is obvious that some greater Power exists by which the forces of nature were created in union with matter. I may also say that it is no small proof of a Creator, that the elements of all combinations which are generated by animals and plants are derived from the inorganic kingdom, which will be allowed to be less productive than the organic. And since, especially, no organic body can generate any elementary substance, nor the elements unite of themselves into organic compounds, it follows that the whole was created by a Being of greater Power. We can go no farther back than the elements of matter. Here the atheist himself pauses in dismay. They proclaim a God, and reason submits to this limit of its power.

The reader who may not be acquainted with physiology should

understand that the common mode of representing the composition of animals and plants as consisting of *carbon*, *hydrogen*, *oxygen*, and *nitrogen*, is intended to express the principal elements; but that, instead of that limited number, there are not less than sixteen found in animals—namely, *carbon*, *hydrogen*, *oxygen*, *nitrogen*, *potassium*, *sodium*, *chlorine*, *phosphorus*, *iron*, *sulphur*, *silicium*, *iodine*, *bromine*, *fluorine*, *manganese*, *magnesium*. The same elements, with the addition of *aluminium*, also occur in plants. The last six, however, are less uniformly present in animals than the first ten. With these premises I shall now proceed to transfer from my *Institutes of Medicine*, and other publications, the facts and the arguments which I laid before the world many years ago relative to the composition of organic beings.

Now, Chemistry deludes us with the notion that animals and plants are made up of *only four* elements, because they are sufficient, or only three of them, to form an organic compound. But we are speaking of the entire body, not of simple compounds. The latter are quite worthless, excepting as food, unless made up, along with the other elements, into tissues and organs, blood or sap, and a symmetrical whole.

Of all the foregoing elements, only two, oxygen and nitrogen, as they compose atmospheric air, exist in a condition which would possibly admit of their coming together without some special agency directed by an intelligence at least as exalted as human reason. With this auxiliary they must also all exist in a *simple*, *elementary*, and *gaseous* condition. Only *two* of the whole number have that requisite simplicity—oxygen and nitrogen! Well may the advocates of the spontaneous origin of living beings, or even of the most simple organic compounds, in the elements of matter, be appalled at this suggestion, and condemn his wits that it had not occurred to him before he had lost them. But let us now tell him of all the facts. Of the two other indispensable elements for an organic compound, *carbon* is either solid, or almost indissolubly united with oxygen in the form of carbonic acid (though readily decompounded by the leaves of plants), and *hydrogen* is also chemically bound up with oxygen in the form of water; while chlorine, which has a far greater affinity for hydrogen, neglects it entirely. Here, then, are the four principal elements, and how ridiculous does the assumption

appear of their spontaneous union into any sort of a compound, organic or inorganic! That erudite Chemists should have neglected this consideration is a most remarkable proof of the blinding nature of an ambitious hypothesis. As to the remaining twelve elements, they all exist in a solid form, and, with the exception of iron, manganese, and sulphur, always in combination with one or more of other elements. But let us suppose that they were all floating together, along with nearly fifty other known elements of matter, in a gaseous condition, it is sufficiently manifest that they could not have emerged from the common mixture through any other agency than that of a Designing, Almighty Power—to say nothing of their incorporation into an organization like the animal ovum, which embraces the rudimentary whole of the mature being, or how that ovum was developed into a viviparous animal by the agencies of the inorganic world. But setting aside Creative Power, and considering that the inorganic materials when aggregated together into organic compounds must be endowed with Life, or, rather, what is called Life, whatever it may be, which must have been developed in the elementary substances before they could have been brought into organic combinations, will the Materialist be able to offer the most vague conjecture as to how this phenomenon came to pass, even though it be conceded that Life is some modification of an inorganic force? What, I say, in the latter case, so modified the physical force as to organize the elements into living compounds?

We will now pause a moment to look at the developmental doctrines under the foregoing aspect of our subject; and taking the elements as we find them in nature, one of the principal, *carbon*, and the most abundant in plants and animals, either forming with oxygen carbonic acid, or existing in a solid state, and the next most abundant, hydrogen, bound up in water, and most of the remaining in a solid state, and all of them more or less remote from each other, we shall be in the midst of a labyrinth of absurdities. The sixteen elements found in plants and animals are supposed to have separated themselves from the sixty-three which compose the inorganic kingdom—one series of the sixteen congregating and uniting in such a manner as to form plants, whose office should forever be that of organizing the same ele-

ments out of their original state; while the other series of sixteen came from far or near, and coalesced in such a manner as to form animals, which should be forever incapable of organizing the same elements out of their original state, but always dependent for their continued existence upon the organizing constitution of the vegetable tribes. Let us also keep in mind the compounded and solid condition of their elements when they put forth their elective affinities to form the two complex systems of Design—each system abounding with its own peculiar designs of a highly diversified and harmonious nature, all the designs in each system working together for the good of each other and for the great ends of their being; while the vegetable system, that it may fulfill its great final cause of supplying food to the animal kingdom, is endowed with the faculty of decompounding inorganic compounds and of tearing the very rocks asunder. Moreover, such are the mutual relations of plants and animals, the latter are made to supply the best materials for the sustenance of the former; so that the living plant builds up the animal, and the animal, living or dead, gives back first to the vegetable kingdom, and ultimately "to the dust," its borrowed fabric.

Farther—the requisite elements for animals and plants are never present in any given localities of the earth, while water contains only two of them. Hence the necessity of manures, derived either from animal or vegetable sources—however much the vegetable tribes may gain a contribution from the mineral kingdom. And this will be seen to be another insuperable proof that the elements of plants and animals must have been assembled by Supernatural Power, and when once brought into this condition, and simultaneously throughout the globe, they became the ready sources of supply to all subsequent generations. As to the earliest sustenance of plants, we shall see that this naturally resulted from the sedimentary deposit immediately consequent on the organization of the earth (*Appendix* I.).

Besides the foregoing supposed coalescence of the elements of matter through their own inherent properties, the hypothesis must also necessarily mean by "the laws of nature," that the atmosphere and water, which are indispensable to every living being, plants as well as animals, contributed a very marvellous organizing influence to bring about their exact and necessary

adaptations to every such being. Indeed, so wonderful and complex are these exigencies to all organic life, that they proclaim, in themselves alone, the necessity of a designing, creative Power. A single animal or plant would have been conclusive of this; and what, therefore, should be the united force of all the animal and vegetable tribes, with respiratory organs in the former of endless variety, according to the nature of the being (as insects, aquatic animals, land animals), by which the adaptations of all the immense variety to atmospheric air are exactly adjusted. And coming to the *food* of animals and plants, the same evidences of Design are incomparably greater—an endless variety in the structure of the digestive organs, according to the nature of the food and the nature of the organic being. Here, also, should be reproduced the radical distinction in that respect between animals and plants—the former subsisting upon organic compounds alone, while the latter upon the simple elements of matter alone, and carry along the wonderful evidence of Design in the existence of the animal kingdom as dependent upon the vegetable for a union of the requisite elements into organic compounds. But the most curious circumstance is the certain fact that plants got into being before animals, which implies an amazing degree of foresight in thus anticipating the necessities of the animal tribes. If, also, there were any foundation for the doctrine of the origin of living beings out of the elements of matter through the forces and laws of inorganic nature, then all the varieties of food as it respects the animal tribes must have had, as well as atmospheric air and water, a precise tributary influence in effecting their organization, in every detail and in all the designs, according to the nature of the species. The same affirmation may be made of *light* and its average duration of twelve hours; particularly in its relation to plants. This agent, therefore, and its periodical nature, must have had an important concurring organizing influence. Hence it would follow that the Creator ordained the earth's revolution upon its axis as much with a view to the creative power of light as to the subsequent exigencies of living beings; which supposes the absurdity, as in the other cases, that He thus devised a plan for the genesis of organic life instead of introducing life Himself by the simple excise of His own power.

But all the foregoing organizing and adapting influences necessarily suppose that other agencies had been in operation in detaching the 16 elements out of the 63, breaking up their compounds into simple elementary substances, converting them from a solid to a gaseous condition, and assembling them from places remote from each other, and then combining them in special modes, not only in their peculiar relations to the two organic departments respectively, but in the animal tribes according to the nature of every organ, and, finally, elaborating, adjusting, and uniting harmoniously into systems of design the component organs of each apparatus, and the entire assemblage into one harmonious whole, with special functions for every individual part—saying nothing of a thousand details, anatomical, physiological, &c., which would require a large volume for their exposition.

Let the intelligent reader consider, also, that the four principal elements of every plant and animal form scarcely a dozen combinations in the mineral kingdom; a fact, indeed, which clearly contradistinguishes the organic from the inorganic world as it respects their fundamental constitution. If both departments of nature are endowed in common with the same forces, and the elements of living beings have come into organic union under the influence of the forces and laws of inanimate matter, then, I say, there should not exist the contrast between a dozen combinations of those four elements in the inorganic world and millions of them in the organic!

The Force or Principle of Life by which all living beings are governed, and the forces of external nature, are, as we have seen, in absolute opposition to each other, as denoted by all the phenomena of animate and inanimate nature. The former is forever conservative and creative, the latter always laying waste. This is manifest enough to ordinary observation in the manner in which the agencies of inorganic nature are destructive of mineral compounds, as everywhere displayed upon the surface of the globe, and beneath the surface in the production of volcanoes, &c. They never build up, but are forever tearing down. Are these the forces, then, to gather the elements of matter, were the latter even in a condition to be thus assembled, and unite them into the endless but harmonious labyrinths of organic beings—to infuse into them a principle of life that shall defeat their destruc-

tive energy? Nay, more; as soon as Life becomes extinct, the forces of inorganic nature, that very heat which is said to be converted into vital force, speedily reduce the body to the most simple condition of minerals. Is that an evidence of their organizing tendency, but never disturbing its elementary combinations while life exists? This rapidity of dissolution in all animals is owing much to the numerous elements which enter into their composition, but more to the great abundance of *nitrogen*. Upon this element depends the ready explosion of the fulminating compounds; and it performs the same disrupting office in the dead animal organism. And so would it rend asunder the living being, were it not restrained by a Principle or Force in direct antagonism with the forces of inorganic nature. Had nitrogen been incorporated with mineral compounds there would have been no stability among them; and even in the atmospheric air it is disconnected from the oxygen. All such compounds would have been perpetually undergoing decomposition, until finally the whole of the nitrogen would have gone off by itself, and nothing of the original compound would have remained. This wonder-working element, so rarely found in the inorganic world (except as a constituent of the atmosphere), forms so important a fact, through its incorporation in the animal organism, in proving a specific Force known as the Vital Principle, that I devoted much consideration to it in my work on the "*Philosophy of Vitality and the Modus Operandi of Remedies*" (1842); and I am led to the present reference to the subject by its important bearing upon Materialism as it respects the Soul. It would be a vain attempt, as I have said, to deduce the existence of the latter from its phenomena while the same rule of induction is denied to the equally unique phenomena of life.*

We shall ultimately meet with distinguished advocates of Darwin's doctrine of development by "Natural Selection" who begin with an elementary cell, and evolve all animated nature from it, but assume that the cell never had a beginning—is self-existent. It will be thus seen that these writers have escaped the absurdities of the origin of living beings in the *elements* of

* In view of the foregoing considerations, it may be anticipated that the doctrine of the animalcular origin of miasmatic diseases, as resulting from the decomposition of vegetable matter, will ere long disappear from the books.

matter through their inherent properties, and at no greater expense of faith in a Creative Power. But let us, for the purpose of definitively settling the important question relative to a "primordial form" or "cell," imagine them as far advanced as the *perfect ovum*—one for every species of animals, instead of Darwin's deformity of "*one* primordial," or Spencer's "cell," embracing the potential whole of all the races of animals. What would have been the condition of all the *ova* of animals which are now matured within the mother, and the whole process of development dependent upon the mother's blood—what, I say, would have been the condition of such ova had they been left to the nursing care of the physical agencies of inorganic nature? But let us concede the absurdity of their resistance of such destructive agencies; whence, then, would they have been supplied with the necessary *organic* nourishment, or any nourishment at all, were it possible that the *elements* of matter could have sustained them and advanced their development and growth? But by no possibility can animal organisms, even of the very lowest grade, be nourished by inorganic matter. The protozoon, for example, though destitute of mouth, stomach, intestine, imbibes solid particles of organic matter into the interior of its body, and there digests them; nor can it appropriate inorganic matter. In respect to all viviparous animals there must have always been a mature parent to supply the necessary material and protection till the development of the ova had advanced to the stage of infancy; and this involves the *necessity* of an antecedent creation of a mature parent.

And here it becomes necessary to state, in order to avoid the imputation of adopting the opinions of others as original with myself, that the arguments which I am about to present as to the creation of man, and all mammiferous animals, and all birds whose young are unfledged, in a state of maturity both of body and mind, were originally advanced by myself in my work on the "Soul and Instinctive Principle," 1848, and repeated in my "Theoretical Geology," 1856, which were at once distributed extensively in Europe; because these arguments, in relation to man, were advanced by M. Guizot, in "*Le Eglise et la Société Chretienne*," 1861, and from him have been repeated by others. The argument in relation to man is, as will be seen,

quoted by the DUKE OF ARGYLL, in his "*Reign of Law*," as original with M. Guizot. I would add, however, that what is now said in relation to the *ova* of animals did not appear in those works, but in my "INSTITUTES OF MEDICINE," 1847.

Whether the ovum be that of an oviparous or a viviparous animal, it equally requires organic compounds for its nourishment and development. In the case of the latter it is nourished and carried through all the stages of development to that of infancy by the blood of the parent, and the moment that independent life begins its nourishment must be supplied through the complicated apparatus of the digestive organs. It must be subjected to the vivifying and reorganizing action of the gastric juice, to the farther influence of the bile, saliva, and pancreatic fluid, to the whole labyrinth of the lacteal vessels, and finally to the lungs, the sanguiferous organs, the kidneys, &c. All these are indispensable means to any farther development or continued existence after the earliest stage of infantile life, both in viviparous and oviparous animals. These are all familiar facts; but their statement is rendered necessary by the developmental hypotheses. We shall have seen, also, that there are many other isolated facts, each one of which will by itself prove the creation of man and animals in a state of *full maturity*. To the fundamental facts and laws, as witnessed in organic nature, we must appeal for all our inductions as to the development of living beings, from the germ to their state of maturity; and least of all may *we* devise hypotheses which, like the developmental, are in direct conflict with what is most fundamental in nature. The laws and agencies of the inorganic world can in no respect divert the progress of development in any individual from its fundamental details. They have no relationship to those which govern the animate world; and the delusive appearances which arise from the influences of climate, soil, domestication, &c., are in no respect diversions from the original structure of species. Nor is there any thing known of structure that can supply the smallest ground for the opinion that it may undergo mutations in any species of animals or plants. The subject is often misapprehended or misrepresented by adducing some isolated part, as the brain and skull, as a basis of comparison for distinguishing or identifying species, when the only proper ground is the entire

organism, especially such parts of it as form the distinct characteristics of species. All the varieties of the dog and of other animals have, respectively, the same specific marks; and so of men. Color is no more a specific distinction in man than in animals. When the artificial influences that have introduced the varieties are removed, and the animal returns to its native haunts, the original conformation, habits, &c., of the species are often restored. And so of plants. The castor-oil plant (*Ricinus communis*), for example, is a perennial tree in some countries, and an annual herbaceous plant in others. But, *mutatis mutandis*, the seeds of the former will produce the herb in the climate of the latter, and *vice versa*. No natural or artificial influences have affected the essential details of organization in man, animals, or plants, in any one species, so far as observation reaches.

I may also recur to the ova of animals for another explosion of all the developmental doctrines, and of the mutation of species. The microscope assures us that, from the beginning of the development of the germinal cell, it manifests, according to the species, an undeviating peculiarity of organization, whatever the varieties of the species; nor can this peculiarity be in the least diverted by any artificial influences. No other proof than this universal and undeviating plan of organic life can be necessary to demonstrate the fallacy of every developmental hypothesis. Whatever variety may have been introduced through a long series of modifying causes, the characteristics of the variety are incapable of detection by the microscope during the development of the ovum. Nothing would astonish the observer more—whatever his developmental hypothesis—than to witness the rudimentary development of the ovum of one species putting on the characteristics of another species, however nearly allied. So closely, indeed, does nature adhere to this principle of uniformity, should one species manifest a change into another species, it would seriously disturb the very foundations of physiology. So it has been ever since man began to record his observations. The entombed animals of Egypt of more than three thousand years ago differ in no respect from those of our own day; and the seeds obtained from the sarcophagus produce the same species as those of our own times. Aristotle's descriptions of animals two thousand years ago are perfect portraits of the species which have come down to us.

All analogy, therefore, as it relates to every species of the almost countless numbers that compose the animal and vegetable tribes, and which form our only ground of reasoning on the question before us, is fatally opposed to Darwinism, Spencerism, and to all other artificial doctrines of the origin of species; and this is most distinctly avowed by the violent manner in which the projectors defy all analogy, both as to organic and inorganic nature, and repose the doctrines upon the assumption that hundreds of thousands or millions of years ago the requisite condition of inorganic nature existed, either for the union of the elements of matter into living beings, or the development of a "cell," or some other "primordial form," and the transmutation of species —all the way from the invisible animalcule to the elephant, whale, and lastly, to man.

The advocates of the creative forces of inorganic nature present an argument founded upon the development of the chick from the egg by the agency of external influences, but are very silent as to the uterine animal. Were it, however, doubtful whether a fundamental principle of analogy obtains as to the origin of the ova both of viviparous and oviparous animals, it is settled by the fact that the unfledged chick would perish as quickly without the provident care of a mature bird as the infant mammiferous animal.

In respect to *Darwinism*, it should be understood that, although it professes to expound the "*Origin of Species*" (and, indeed, they have become equivalent terms), there is not the slightest explanation rendered of the *causes* through which new species are developed out of the pre-existing. And although the doctrine professes to rest upon the laws of nature, it is an unmitigated assumption in direct conflict with every known law or fact that relates to the question, as I shall have abundantly demonstrated. All proof is merged in a demand for a sufficient amount of time. The argument is—given the necessary time, and it will introduce all the various species. All the collateral reasoning is predicated of circumstances which yield no support.

But our Projector contradicts his doctrine when speaking of the law of *inheritance*, which is its indispensable foundation; for he remarks that—"It is *that cause which alone*, so far as we positively know, produces organisms *quite like, or nearly like, each oth-*

er." The law, therefore, as I have said, should hold good forever. But he endeavors to annul the law by assuming that long periods of time will give it a different operation. He also brings to the assistance of time another fiction of intended importance, which he designates as a law of "*Natural Selection;*" which, however, has not the most remote connection with the question, but simply refers to the perpetuity of species that escape the destructive agencies of which others have become the victims. Such as have escaped extinction have done so through "a struggle for existence;" and the most enduring are regarded either as newly developed species or as the progenitors of new ones.* That is all; and it is only on common ground with the geological doctrine of successive creations and extinctions. His "*Laws of Variation,*" also, merely contemplate the facts as they exist without inquiring into the sources of the phenomena; leaving the "origin of species," as respects their causes, just as we find them. But, as if for the purpose of imparting to the doctrine an air of demonstration, he introduces numerous facts under the imposing designation of "*Correlation of Growth.*" This, however, is nothing more than affirming that every species is so constituted that all its parts are in harmonious relation.

Every species, however allied to others, possesses some peculiarity of structure, and where any one part has the greatest variations all other parts have correlated or reciprocal relations. That was the Creator's work, and the "Correlation of Growth" means nothing more.—As to *hybrid* animals, the pretense of its forming any justification of the doctrine is at once confuted by the fact that a single "cross" is generally the limit of transmission. Nor are hybrids met with in a state of nature, either on land or in the water; which is a crushing fact to the schemes of the origin of species. The law is universal, designed for a distinct

* This notion had been already advanced by Lamarck in respect to animals, and by De Candolle in regard to plants. The former supposes that the superior animals drove the inferior into desert places where they gradually died out. De Candolle's opinion of plants has a limited truth. He remarks that—"The first plants which establish themselves by chance in a particular spot tend, by the mere occupancy of space, to exclude other species, the greater to choke the smaller, and the more prolific gradually make themselves masters of the ground." And yet the inferior tribes of animals and plants maintain their ground about as well as the superior—especially the animal.

perpetuation of the species. Every species is endowed with peculiarities of instinct which restrain all sexual connection with other species. It is a leading characteristic of species. The crow, robin, goose, lion, whale, flies — all species of animals, herd, each respectively, by themselves. Among the four hundred and thirty different species of humming-birds, it is stated by the highest authority, Mr. GOULD, in his *Trochilidæ*, that—"After a period of twelve years of incessant labor, I have never observed an instance of any variation which would lead me to suppose that it was the result of a union of two species."—In no respect has the Creator been more provident than in debarring an intermingling of species; and it forms a conclusive proof of their original creation as they now exist. The hybrid animal, and even the hybrid plant, is the work of civilization; the grand design being carried also throughout the vegetable tribes.

As to the *metamorphic* animals, the favorable conclusions which have been predicated of them by the advocates of Darwinism violate the soundest principles in the philosophy of organic life; and this most magnificent feature in the Designs of the Creator, so far as obvious to the senses, is made an integral part in a system of deformities. This I shall render manifest when speaking of metamorphosis in my demonstration of the Instinctive Principle, where I shall show that it forms one of the most conclusive evidences against all the aspects of Darwinism and Spencerism.

Let us now imagine the absurdity that mammiferous animals and man were created in a condition as far advanced as the stage of infancy—what, I ask, could have nourished those infants but a mature adult, yielding milk? And so of all birds whose offspring are unfledged—what but a mature parent, endowed with a marvellous Instinct, could have supplied the necessary food to those perfectly helpless beings? This collateral evidence of Instinct, which extends throughout the feathered race, is as much a constitutional provision for the life of the offspring as that which is designed for self-preservation, and should settle the question with all who can not rely alone on the exigencies of infancy; while a similar corroborating testimony exists in the parental Instinct of mammiferous animals, and another in the provision of the lacteal gland, and still another in the Instinct which conducts the infant animal to the source of sustenance.

Immediately allied to the foregoing is another indisputable proof of the creation of man and all the foregoing animals in a state of maturity, which consists in the mutual attachments of mother and offspring, and which could have had its foundation only in the original constitution of the mature being, simultaneously ingrafted upon the parent and the germ, and, on the part of both, for the specific end of preservation. And while this must be approved by all common sense, it derives farther confirmation from the peculiarities of Instinct in every species of animals, and especially so where the organization and Instinct relate to distinct varieties of food—being the product of the parent in the case of mammiferous animals, and wholly extraneous in that of birds; while in respect to the former the digestive apparatus is so constituted in certain tribes as to be suited alone to animal food after the offspring becomes independent, and in other tribes to vegetable substances only. And how clearly, also, does the failure of parental care and attachments among animals at ordained times denote a law of nature whose commencement began with the mature parent. And if all this be not sufficiently convincing, I may bring up the elaborate means with which animals and plants are provided for the perpetuation of their species.

Look now at the contrast between the developmental doctrines and the statements in the Mosaic Narrative, and observe how forcibly it comes to the proof of the Inspiration of the latter. By this we are told that man and beast were created in a state of maturity out of the earth; but had it been said that the materials of the earth organized themselves into living beings, the Narrative would have been rejected by all as an imposture. Nay, more, had it been affirmed that man was created in the condition of an infant, and thus left to grow up to maturity under the laws which govern his organization, without maternal sustenance and protection, without scarcely a ray of instinct, destitute of volition and muscular power, the personification of helplessness, the statement would be invariably pronounced absurd. On the contrary, the Narrative declares exactly what the exigencies of the case demand—the creation of both man and woman in a state of maturity, both of body and mind. Were there nothing besides to substantiate the Revelation of Heaven, the proof which is offered by the *infancy* of man, in being conclusive as to

his origin, would extend itself to every other statement in the Mosaic Record. What, also, I have thus said as to the absolute exigencies of man in early life is equally applicable to all mammiferous animals, and to all birds whose offspring are at first unfledged, in respect to the nature of their early food, who would, of course, immediately perish without the sustenance afforded by the parent. But the infant quadruped, yea, the newly-born orang-outang, is immeasurably better provided for its own independence than the human infant. The former has all the instinct in operation necessary to procure the means of sustenance, with only the passive submission of the dam in yielding the earliest sustenance, and can in all other respects manage for itself; but would immediately perish without the food supplied by the mature parent. And while the mammiferous animal, including all the tribes of apes, uses its limbs freely on the day of its birth, the human infant has scarcely the ability to stand erect at the expiration of a year, much less to clothe and clean itself. Nor is the child as far advanced at a dozen years in a condition of independence. And here I may add, in farther disproof of the developmental hypotheses, the constitutional distinctions as to Reason, Instinct, and physical endowments, which greatly estrange the human race from the most perfect tribes of animals, living or extinct.

In looking around for the species of animal out of which the human race is supposed to have been developed, that which approximates man most nearly in organization must enjoy the distinguished honor of paternity—the gorilla, orang-outang, or some one of the monkey tribe. It is considered that organization in these instances is so close upon that of man as to supply in this abstract sense a plausible pretense for a still closer relationship; and it follows, therefore, by the analogies of nature, as well as by the law of inheritance, that *Reason*, the grand characteristic of the human race, should have also made some approximation in the gorilla or chimpanzee towards that Divine attribute of man. But I shall endeavor to demonstrate that no animal possesses that endowment, and that the whole tribe of apes and monkeys are less provided with instinct than the honey-bee, while man dwindles into insignificance by the side of the gorilla and orang-outang in respect to *Instinct*. However great, therefore, may be

the coincidence between the organization of man and the tribe of apes, it is impossible to evade the fundamental distinction which is established by Reason and Instinct. But even in respect to organization there are some things which concur with reason in enforcing the conclusions to which it conducts us. Man, for example, walks erect, but that would not be sufficiently characteristic to prove the distinct and independent nature of his being. The absence, however, of all correspondence in the uses of his upper and lower extremities, while in the quadrumanous tribes they subserve the same purposes, does estrange them fundamentally from each other; and this argument is vastly increased by the fact that the arms of the human species are intended to fulfill the promptings of Reason, while the fore legs of the quadrumana are scarcely more tributary to Instinct than the posterior legs—all of which are properly legs. It is true, there is an approximation in the anatomical structure of the fore and hind feet to those of man, especially in the Gorilla; but the proper criterion is the uses of each. Each, in the animals, is prehensile, and they are employed in walking. Their fore feet administer scarcely more to the purposes of Instinct than the fore legs and feet of all animals possessing clavicles, who use them more or less as arms and hands; such as the cat, lion, squirrel, bear, &c.; while, like these, the whole tribe of apes walk upon "all fours."

> "And while all other creatures to the dust
> Bend their low look, to man a front sublime
> He gave, and bade him ever scan the skies,
> And to the stars lift up his lofty gaze."—Ovid.

When I come to the Demonstration of the Instinctive Principle (Chapter XVI.), I shall have something to say on the comparative improvement of which Reason and Instinct are capable. But I may now remark that if man and the ape were akin to each other, the primitive man should have been as incapable of mental culture as the ape itself. It is true, as will be seen in our Chapter on the Antiquity of Man, it is assumed that no intellectual progress was made by the human race for tens of thousands of years. But if that were so, the same limit of improvement should have still obtained, not only through constitutional inheritance for thousands of ages, but because of the evidence sup-

plied by the stationary nature of Instinct, in all species of animals, from the lowest up to the quadrumanous tribes. I would refer the reader, also, to many other important distinctions between the human mind and the Principle of Instinct embraced in the Chapter on the latter subject—such as the relative uses of Reason and Instinct, and that great characteristic of the human race, the Religious sentiment.

It would be disastrous to the hypothesis to assume the extinction of the supposed immediate ancestor of man, which would be as little likely to become extinct as man himself; nor does geology supply any evidence of a higher order of animal than the gorilla and chimpanzee.

The Darwinian, or the advocate of whatever doctrine of the origin of species that departs from the Mosaic, being thus variously defeated, doubtless points in a characteristic manner, for the means of sustenance for the infant man, to those whelps, Romulus and Remus, that sucked the Wolf. Then I apply to him the *experimentum crucis*, and ask him, with overflowing sympathy for his offspring, whether he would be willing to intrust his darling infant for an instant of time to the hairy embraces, or the provident care, of a baboon or a gorilla; and whether he would not himself be appalled should he encounter one of them in the wilderness? Why, also, has it happened, if Man be developed from any of the tribes of apes, that the parent has so completely estranged itself from its offspring? And the same interrogatory may be applied to the different species of animals in the progressive series. Even Professor HUXLEY, with all his devotion to Darwinism, laughs at the idea of his direct descent from a monkey. "What," he exclaims, "*an enormous gulf*" between us—"*practically infinite!*" Nay, even WALLACE, the competitor of Darwin for the honor of starting the doctrine of "Natural Selection," abandons, in his *Contributions to the Theory of Natural Selection*, all hope of showing that man was developed out of animals, and argues strongly against the assumption. If it be conceded, therefore, that man is an exception to the developmental doctrine, its visionary character is thus fully betrayed. There is no such inconsistency in nature as a law for the production of animals and another for man, who is so completely allied in organization and functions to the higher orders of animals; and if,

also, it be admitted that man was a direct creation, according to the Inspired Narrative, the admission must be extended to the animal tribes. And yet we shall see that certain Darwinists, to surmount the difficulty of applying the developmental hypothesis to man, or from a disinclination to carry the doctrine to such an extreme extent against the Biblical statement, compromise the matter by delegating the animal races to the laws of nature and the human race to the more intelligible work of the Almighty!—while the origin of the vegetable kingdom is excluded from the scheme, or consigned to the vivifying and designing properties of the elements of matter!

But in respect to man and animals there is a lingering hope of reconciliation. The want of a closer alliance of species between the brute and human races than is supplied by the tribes of monkeys has so alarmed the Darwinian school, that it has recently brought forward bones of the human species in which it is alleged that there can be seen some variations from the conformation of the existing races, and which are assumed to be significant of a species intermediate between man and monkeys. But if this be so, it in no respect affects the question before us, since every race of mankind is marked by some peculiarities in the bony fabric, especially in the skull; and in multitudes of instances there are special conformations peculiar to individuals. Such, indeed, are the varieties of conformation of the bones of the skull among the different races of men that they have formed the principal ground of the doctrine that the several races have descended from as many distinct ancestors. The deductions, therefore, in behalf of Darwinism from the reputed peculiarities of recently discovered bones, even were they sustained as they necessarily should be, would amount to nothing more than such as have been predicated of the existing races of men in proof of the multiplicity of original ancestors.

All such expedients, however, have no tendency to affect the necessary implication of Darwinism that Man was evolved out of the Monkey tribe; and this has become so offensive to human pride that some of the Idolaters have taken the reponsibility of misrepresenting their master's doctrine. "The present method of escaping the difficulty," says the Christian Union, in a notice of Dr. Cubbold's Biological Lecture, of the British Scientific As-

sociation, "is by continually begging the world to please to remember that all these divergent groups, which thus appear on the geological panorama so closely on one another's heels, did not, according to the right interpretation of their master's theory, grow out of one another, but that they represent the terminals of certain lines which have been running along down parallel from some remote progenitor, from whom the different types took their common origin and also their divergent direction. Thus they say that Man did not necessarily derive from the Ape; but from some common ancestor of both two lines took their start, and each, under the guidance of natural selection, pursued its separate development, till *Man came in one line and* MONKEY *in the other.*"

The foregoing subterfuge may render the doctrine less offensive to some. But all forms of the developmental hypothesis, in whatever shape they may be urged upon the ignorant and credulous, are alike condemned by our demonstrations, through which we show the absurdities of supposing that a cell, or an ovum, or any other imaginable undeveloped form of Man and mammiferous animals, could have survived a momentary independence of its placental relations, or the agencies of the external world; and that, moreover, from the exigencies of the case, man, mammiferous animals, and birds must have been created in a state of perfect maturity of body, and with Mind enough to supply themselves and their offspring with the means of sustenance and protection.

Nor does the recent work by ST. GEORGE MIVART on the *Genesis of Species*, although intended to modify, in some minor respects, the Darwinian hypothesis, affect in the least the absurdities of the developmental scheme, or its pantheistical character. Like some other writers upon the same topic, he invokes the opinion of St. Augustine and other "Fathers of the Church" as favorable to the doctrine of the origin of living beings in the laws of inorganic nature or spontaneity of being. "They hold," he says, "that when God said 'Let the waters produce,' 'Let the earth produce,' He *conferred forces on the elements of earth and water which enabled them naturally to produce the various species of organic beings.* This power, they thought, remains attached to the elements *throughout all time.*" These opinions are inculcated by Mivart, and are applied by him to the origin of man as well as

animals. They are, of course, obnoxious to all the objections which I have arrayed against the assumption of spontaneity of living beings, creation by law, Darwinism, and every other shape of the developmental doctrine.

Darwinism has done its best to avoid so great an offense to "Science" and creative consistency as to allow man to be excepted from its scheme, and is always expecting that something will turn up to justify its only rational conclusions that are founded upon the resemblance of the organization of the monkey tribes to that of the human species. That is the fundamental basis, and there can be no departure from it. It must take man along, or abandon the whole ground as a weak invention.*

Here is an exemplification of a part of the philosophy which governs Darwin's "*Origin of Species by means of Natural Selection, or the Preservation of Favored Races in the Struggle for Life;*" though it does not tell us how the various species were developed out of each other after their succession started from the "one primordial form;" for whatever ambiguities may have been woven around the problems, it is very certain that the original principle of development which was implanted in the "primordial form" was perpetuated from one species to another, or the doctrine would contradict itself. The following illustration, therefore, does not apply to the fundamental principle, but is simply an incident wholly unworthy of the hypothesis of development. It is taken from Sir CHARLES LYELL'S "*Antiquity of Man;*" and Sir Charles conveys the impression that it embraces the sum of the Darwinian doctrine. Nor is it, as we shall see, at all a representation of Lamarck's doctrine of the origin of Species. But it is well worthy of notice for its caricature of nature, and as showing what is meant by "natural selection" and "struggle for existence." (See Darwin's and Lamarck's hypotheses stated in Chapter VIII.) Thus says Charles Lyell—

"Lamarck, when speculating on the origin of the *long neck* of the Giraffe, imagined that quadruped to have *stretched himself up* in order to reach the boughs of lofty trees, until by continued efforts, and *longing to reach higher*, he obtained an elongated neck

* Darwin's late work on the "DESCENT OF MAN" was published after this work was prepared for the press. See another note upon the "*Descent of Man*" in Chapter VIII.

[that is, added a large number of vertebræ to his neck]. Mr. Darwin and Mr. Wallace simply suppose that, in *a season of scarcity*, a long-necked variety, having the advantage in this respect over most of the herd, as being able to browse on foliage out of their reach, survived them, and transmitted its peculiarity of cervical conformation to its successors."

In Darwin's case the long neck is supposed to be as much an accidental circumstance, however different may have been the causes, as in Lamarck's. It is false even to geological facts that other species of animals died out at the supposed era of the Giraffe; otherwise he should have "stalked alone," in geological phrase, "the monarch of the earth." It is clear, therefore, that he has been no more perpetuated by "a season of scarcity" than all other animals, but very much after the manner of the present day. I may say, also, that the inquiry is naturally suggested, by the foregoing statement, whether the long neck of the Swan was owing to the animal "stretching itself" in pursuit of food in deep water, or perpetuated, at the expense of other animals, by "a season of scarcity" on dry land, and whether its paddle-feet, and those of other aquatic birds, were brought about by efforts at swimming; and whether the long tails of the Monkey tribes be owing to their "longing" for means of support among the branches of trees, or to "a season of scarcity" upon the lower bushes, and particularly, also, how so many different species of that order of animals obtained their long tails, and why, according to Darwin's doctrine of inheritance, the long tail disappeared so abruptly in man; nor should the inquiry be neglected, in this connection, as to the cause of the proboscis of the different species of Elephant and Mastodon. As to the tail and hair of the monkey tribes, Mr. Darwin must dispose of their disappearance in the human race consistently with the doctrine just stated; and it may be suggested for his consideration whether some one species as it approximated man in self-esteem did not regard these appendages as deformities, and therefore through successive generations amputated the tail and plucked out the hairs, until at last, through the doctrine of "Natural Selection," they disappeared in obedience to the law of inheritance. The beard was, of course, neglected; and although the invention of the razor has been supposed to mark an era in the progress of civilization, I would

farther suggest to the Darwinists whether the fact of its being now cast aside is not a proof, in their judgment, that the original hairy man retained his beard as an ornament to his features, while the same taste existed then as at present in relation to the female sex.

It is also, according to Sir Charles Lyell, another special recommendation of Darwin's hypothesis, that—"The theory of the origin of species by variation will also explain why a species which has once died out never reappears."—But is not this a very substantial proof of the Mosaic doctrine, that there has been but *one* Creation, and that by an Omnipotent Being?

We must not neglect, in the foregoing connection, the hypothesis of the distinguished Professor CARL VOGT, who, in a Memoir on "Microcephali," resorts to the expedient of imperfect developments, or so-called "monsters," a *lusus naturæ*, as an argument to show the development of man out of the tribe of apes; which is eminently worthy of the so-called "Modern Science." It should be also understood that none of the peculiarities of "monsters" —such as club-feet, small heads, idiocy, &c.—have been known to be perpetuated. Organic nature is constituted upon a very different plan than is here represented. But we will hear the Professor. Thus—

"Microcephali and natural idiots present as perfect a series from man to the ape as can be desired; and since it is possible that man, by arrest of development, may approximate the ape, the formative law must be the same for both; and so we *can not deny the possibility* that just as man may, by arrest of development, sink down to the ape, so may the ape, by progressive development, approximate man."

The fallacy of this reasoning will readily appear, not only from its violation of the assumed law of progressive development from the lowest to the highest, and thus laying the foundation for an hypothesis that would carry back the organic world to the "primordial form" and contradict itself, but from the fact that the malformation of the idiot's brain no more affects his condition as a human being than the monster that is born without a brain, or with a club-foot; nor are any of these malformations of a constitutional or hereditary nature. On the other hand, the derivation of man from the monkey can not be disproved by the

differences in the development of the brain, or in the conformation of the skull, as attempted by Figuier, in his *Pre-historic Man*, and other distinguished writers. Facts and principles of a far more fundamental nature must be arrayed in opposition. Darwin's developmental doctrine reaches as far back as something like a primordial cell, and if a long series of brains, starting from that primordial form, can be progressively developed in an ascending order till it reaches the tribes of apes, we may not then pause over the lack of similitude between the brain of man and the monkey, and endeavor in this manner to defeat a doctrine which has surmounted incomparably greater obstacles. Nay, more; if any part of the developmental plan be accepted, then, by the irresistible analogy which is supplied by the coincidences of organization and functions, man must be included as an integral part of a systematic whole. And *vice versa*, if one animal was originally the direct work of Creative Power, so were all others.

And now let us advance to the climax of absurdities that distinguish the developmental hypotheses—the complete antagonism of that consistency in the forces and laws of nature upon which these hypotheses profess to be founded. When the plant or the animal had attained a state of maturity, by what invoked consistency of the laws of nature shall we explain the complete abandonment of her original plan of populating the globe (whether through the elements of matter or some "primordial form") for an universal sexual system throughout the animal and vegetable tribes; and this especially at a time when all those convulsions had ceased which entombed races of animals in the rocks, and when inorganic nature had become so much more auspicious for the exercise of its "parturient faculty?"!!

There may be some among those who adopt the developmental schemes that are not disposed to abandon the Soul or its Immortality. But it will not be denied that the same philosophy must obtain here as in all the supposititious conclusions of a physical nature, and that it must be equally true that the Soul of man not only originated but became rational and immortal under the influence of those forces and laws of inorganic nature which are supposed to have given origin to his material body—whether it have been according to the doctrine which begins

with the elements of matter, or that which starts with "blastema," or a "cell," or some other "primordial form." As the first of these doctrines supposes that the elements of matter united into living beings in virtue of the properties with which they are endowed, by parity of reason, therefore, the immortal Soul must have had the same origin. If this absurdity be not admitted, then must the advocate of a Soul equally abandon the delusion of creative properties in the elements of matter. Or, if a truly Creative Power be invoked for the particular difficulty as to the Soul, so also the physical structure and its Life must fall under the same rule. There is no greater evidence of "vital properties in the elements of matter" than of the Soul or Instinct. Or, if in any aspect of the developmental doctrines, Creative Power be allowed to have had any participation in the production of organic beings, there can be no compromise with the hypothesis of second causes as it respects other parts of the same beings. While the Creator was employed about the immortal Soul, it must be allowed that He would have consistently attended to the no less difficult organization.

But, as I shall have shown by their advocates, all the schemes of development under the laws of inorganic nature necessarily exclude the Soul, and refer the manifestations of Reason to the physical structure. If there were, therefore, any foundation for the doctrines, these manifestations should be well pronounced in the advancing series of animals out of which man is supposed to have been developed—as much so as, when starting with the elements of matter, the Soul is supposed to be inherent in the elements. And this would be equally true if man were allowed to be endowed with a Soul; which, as in the former case, would carry us back through all the ascending series of animals till we reach the "primordial cell," or Darwin's "one primordial form;" for there alone can we look for the beginning of an immortal Soul. If such an Essence exist, and were not inherent in elements of matter, or in the cell, or at least in some animal anterior to man, it must have been a supernatural endowment of the human race, or, in other words, a special Act of Creative Power, and therefore, also, by an irresistible logic, man's physical structure was equally a direct act of the same Power.

Some late Theological Writers maintain that man was created

in the manner affirmed by Moses, but are willing to concede the animals to Mr. Darwin. We have seen, however, that they are on common ground as to the exigencies of a mature creation. If man or a single animal were created in a state of maturity, so also were all others; or, on the contrary, if a single animal came into being through the properties of matter, or was originally developed from an ovum, a cell, or a blastema, the same construction, respectively, must apply to man and to all animals—especially if a Personal Creator had any hand in the matter. The proof is irresistible, since it rests upon the coincidences in their organization and general and special functions, the elements of which they are composed and their relative proportions, their mode of procreation, and of sustaining their infant offspring, &c. The functions, also, of the human mind and of the instinct of animals, are in many respects so nearly alike, that many philosophers are of the opinion that they differ only in degrees. The evidences of Design are exactly the same in all. If man, therefore, were created in a state of maturity, so also must have been his organic congener; or, on the other hand, if animals grew up from the elements of matter, or from a germ, then certainly did the human race. Nature can not be disjointed in these fundamental conditions. The same philosophy must be extended to all the inferior animals, where we meet with the same Unity of Design as in the superior races; for they have the same elementary composition and the same essential functions; and equally, also, for similar reasons, must all the vegetable tribes be embraced under the same rule.

Nor will I leave this important subject till I show the application of the foregoing facts to the so-called "typical plan" of development, and which will be seen to be as fatal to that as to the Darwinian assumptions.*

* The principle involved in the "typical plan," or "system," or "types of creation," is briefly this. Theoretical Geology maintains that organic life began with animals and plants of the most simple forms of structure; that a type was then introduced which should serve as a foundation for the next in the series, and so on with the successive productions of animated beings throughout the long chain of ascending analogies in organic structure till they reached the highest complexities in mammalia and phenogamous plants; that the simple forms flourished or "reigned" for a "long, indefinite period of time," when they were *altogether* extinguished, according to some, and *not altogether*, according to others; that "the earth was then remodelled," or changed in its physical condition, so as to be better adapted to the next fol-

The proof is coextensive with all organic nature—displaying one grand Unity of Design all the way from the microscopic plant up to man. The typical hypothesis takes no cognizance of the fundamental plan of organization in its broad extent, but reposes upon the skeleton and external appendages, and certain differences in the form of organs between extinct and living animals and plants, but such only as now occur as distinguishing marks among existing species. The variety in the details of organization does not affect in the least the unity of the grand principle upon which all the details are founded. There is but one pervading Design throughout all the individuals, from the lowest to the highest, that compose the animated kingdoms—that Unity of Design stretching from the lowest vegetable organism up to man. To appreciate this wonderful unity in the plan of organization, instead of looking at the details, consider a single one of the general principles—that, for example, which constitutes the greatest final cause of all the vegetable tribes, the combination of the simple elements of matter into organic compounds. This, as we have seen, is the great function of every plant, however low or however high in the scale of organic life, and it assures us, without any knowledge of the details of structure, that it must

lowing improvement upon the original "type," and which should serve as an advancing type for the next series of improvements, though simultaneously with the new production the original "type" was reproduced, either in the pre-existing species, or in others analogous to them; that this second production "reigned" for a long, indefinite time, then became extinguished, the earth again remodelled and better fitted for the next ascending link in the chain of organization; and so on through numerous repetitions of the same processes, till the progress of improvements finally culminated in man.

The "typical system," therefore, is not the doctrine of *transmutation* of *species*, which forms the essential feature of Lamarck's doctrine; nor of Darwinism, which is nearly akin to Lamarck's. Hugh Miller, in condemning the hypothesis of change of species from one to another, sets forth the true geological doctrine of the typical plan of spontaneity of being. Thus he says—

"But while no hypothesis of development [by which he means transmutation of species] can neutralize or explain away the great geological fact that every true species had a beginning *independently*, apparently, of every preceding species, there was demonstrably a *general progress from lower to higher forms*."

Sir Charles Lyell, as will be seen in our thirteenth chapter, was a thorough advocate, in his Principles of Geology, of the origin of living beings in the forces of inorganic nature; and such, indeed, was the doctrine of Theoretical Geology, in a general sense; though recently it has exchanged its "typical plan" for the Darwinian "Origin of Species," as a more plausible variety of Pantheism.

be constituted upon a common plan throughout the vegetable world. Wonderful, indeed, that this immense proof of Unity of Design in the plan of organization should have escaped the understanding of the human mind, and that all its details, in being parts of a common whole, must have been of simultaneous orgin, and that it was the work of an Omnipotent Mind. But you ask, perhaps, if there be any similar comprehensive proof of an unity of plan in the organization of the animal tribes, and especially, also, of the extension of that unity throughout the two animated kingdoms? The answer carries with it a force that must overpower even the atheist. Yes, I say, there is a proof exactly collateral with the foregoing, and while it establishes an identity of plan for animal organization, it equally shows that a common plan pervades the animal and vegetable tribes—namely, all animals are ultimately dependent upon plants for their means of sustenance, and every animal, therefore, must possess an organization qualified for an appropriation to its own uses of those organic compounds which are generated by every plant; and therefore the plan of organization must be the same in all animals, and specifically constituted for the assimilation to its own organism of those compounds which are the work of the vegetable kingdom. A similar universal proof exists in the coincidence in the means for perpetuating the species in both organic kingdoms; while this very provision, also, declares a coincidence in all their organic functions, and therefore an unity of plan throughout organic life.

Thus, also, the whole plan of organization must have been always precisely the same throughout every link of the vast chain, and the physical agents of life, therefore, always the same. Hence it follows that the whole typical system of Theoretical Geology—which is founded not upon differences in the plan of organization, but upon details in relation to organs—is one of the greatest fallacies that has crept into science. Nor, indeed, could this speculation have pervaded the works of Geologists, any more than the recent novelties of Darwin, Spencer, Huxley, &c., had any one of the numerous projectors been duly informed in the science of Physiology. Why else has it not occurred to such minds, in contemplating the inconceivable variety of designs that compose the organic kingdoms, and yet all constituted upon a

common plan, and with a *unity of purpose*—why, I say, has not the very finding out of these designs, and the assurance of their existence as such, established the conviction that they must have been immediately and simultaneously brought into being by the creative energy of a Designing Intelligence?

Other considerations relative to the "typical plan," showing still farther its superficial nature, will be presented in the next following chapter, and, indeed, more or less throughout those which follow. But I will now submit the following, which, as well as the preceding demonstrations embraced in this chapter, the reader should carry in mind as applicable to all the hypotheses which depart from the Mosaic doctrine of Creation. It is this: The substituted hypotheses suppose that the Laws of inorganic Nature brought forward, progressively, the animal and vegetable tribes from the lowest to the highest forms of organization, and even without a break in the regular chain. Now I say that this is exactly equivalent to a direct Personal act of the Creator; for it supposes that a blind Law of Nature acted with precisely the same Intelligence and forecast in having never deviated from that exact methodical plan—never brought forward a plant or an animal out of the thousands of species, except in its precise place in the graduated scale of organic life. Now which does the reader prefer, this supposed endowment of the destructive forces of Inorganic Nature, which I have variously shown to be surrounded with absurdities, or an Intelligent Being who was not only capable of carrying out the minutest details of the "typical plan," but, with a more becoming consistency, of creating simultaneously and in a state of maturity each department of Organic Nature?

I shall have something also to say, in the next following chapter, upon the sexual system, but may now propose for the reader's consideration whether he prefer, in the deliberate exercise of his reason, imputing the distinction of the sexes, the wonderful and complex organization which forms that distinction, and this substitution of generation for the forces of inorganic nature—whether, I say, he prefer an endowment of these forces with a *sexual* organizing Law to the direct fact that the Creator adopted a less "roundabout way," and one that should be consistent with all subsequent Laws, both of inorganic and organic nature, and at once "created them male and female?" Which alternative is

most consistent with Creative Power while engaged in the immediate work of Creation?

Such, again, are the characteristic evidences of Unity of Design in all the Creator's plans; and wherever they may fail in that principle they are the devices of man. What would have been the fate of the Narrative of Creation had it presented the deformities of the "typical system," or of any doctrine of evolution under the laws of inorganic nature! Who would have been so untrue to his own reason as to credit the statements? On the contrary, they would have been ignominiously spurned by the very projectors of those doctrines! The contrasts, therefore, between the works of Creation and their distorted interpretations enlighten us at once upon the antagonism between Divine and human wisdom. This is apparent enough in the contrasts that relate to the origin of animated beings; and when we come to the six days of Creation, where it is affirmed that the Life and Soul of man were as much direct acts of creation as the body, there will be found the same harmony in the progressive stages, the same undeviating unity of plan in all the details as witnessed in the plan of organic life, and the same evidences of a Sublime Intelligence as the Author of the whole, to be contrasted with the cosmogonies of human reason.

I have had occasion to advert to many evidences of Design that expose the absurdities of Atheism, Pantheism, Spinozism, but none on such a scale of sublimity as those which I have introduced in the immediately preceding pages in demonstrating the absolute ignorance of the constitution and laws of organic beings which has assigned their origin in the elements of matter, or their development from a germ of unexplained origin, to the agencies of inorganic nature.

CHAPTER VIII.

THE FACTS AND ARGUMENTS IN BEHALF OF MATERIALISTIC DOCTRINES CONTINUED.—REIGN OF LAW.—CREATIVE LAW.—DARWINISM.—LAMARCKISM.—SPINOZISM.—PANTHEISM.

FROM what we have already seen of the application of the doctrine of "Correlation or Equivalence and Conservation of Forces" to *materialism* as it respects the negation of a Soul, the reader must have inferred that it is also *atheistical* in its tendencies. Let us, in the first place, look at a simple corollary of the foregoing doctrine, and observe how atheism is positively implied, whether so intended or not. Thus Professor GROVE, in his "Correlation of Physical Forces," educes from the doctrine an infinity of worlds. When endeavoring to show that no light is lost, but that a proportion is probably "converted into some other mode of motion," he says that—

"It may be objected that this hypothesis assumes the stellar universe to be illimitable. If pushed to its extreme, so as to make the light of night equal that of day, provided no stellar light be lost, it does make this assumption; but even this is a far more rational assumption to make than that the stellar universe is limited. Our *experience* gives no indication of a limit. We can not conceive a physical boundary, for then comes the question, what bounds the boundary?" Sir Isaac Newton anticipated the answer. Looking upon worlds as limited, he deduces a cogent proof of the existence of an Almighty Power; for, says he—"*The outside would gravitate towards the middlemost without a Divine Power to conserve it.*" Our Author goes on—"And to suppose the stellar Universe to be bounded by infinite space or by infinite chaos; that is to say, to suppose a spot—for it would then become so—of matter in definite forms, with definite forces, and probably teeming with definite organic beings, plunged in a universe of nothing, is, to my mind at least, far more unphilosophical than to suppose a *boundless universe of matter* existing in

forms and actions analogous to those which, as far as our examination goes, pervade space."

If such, then, be the case, the universe is self-existent; or, on the other hand, if the work of an Omnipotent, Creative Power, that Power could have no limit to its exercise; and since space is illimitable, such a Power should be able to create worlds throughout eternity. Should He render them infinite, His Power will then come to an end; which is contradictory of Infinite Power, and therefore the hypothesis of an infinity of worlds excludes a Creator. Moreover, as the organic beings of this earth had a beginning, and inferentially, therefore, of all other inhabited orbs, it follows not only analogically that the orbs themselves had a beginning, but especially so as they were designed for the abode of created beings. We may also well follow a guide so absorbed with the theory of *Gravitation* as Sir Isaac Newton, when he surrenders the all-pervading force, and yields the ultimate conservation of worlds to the immediate agency of that Being of whom alone infinity can be predicated.

That the doctrine of the "Correlation and Conservation of Forces" not only lies at the foundation of Vital and Mental Materialism as at present advocated, but that its tendency is atheistical, is more than sustained by many scientific minds—nay, is unequivocally avowed. Here, also, as with the immediate subject of this work, it is important that our authorities should speak for themselves, as one of the best means of confuting their error and as farther illustrative of their premises in behalf of mental materialism. As examples of this effort recently made upon the basis of the "New Philosophy" of Correlation and Conservation of Forces, and of its extensive prevalence, I shall introduce the writings of some of its most distinguished advocates. Let us then first refer to one of the principal sources of the "New Philosophy," in a work on "*Force and Matter*," which has been already before us (Chapter VI.), by Dr. Louis Büchner, President of the Medical Association of Hesse-Darmstadt, 9th edition, Leipsic, 1867. I may say, also, that such is its popularity in England it has been honored in a short time with many editions by the London Press.

The distinguished Author supplies a very good apprehension of the objects of his work, and of the manner in which it has in-

spired other eminent Writers, and of what we are to expect from this "New Philosophy," in a letter to the English editor (1863) connected with the work, and from which I make the following extracts:

"It is just the works of eminent Englishmen which have, within the last few years, given *an unhoped for support to my mode of viewing natural phenomena, so that we may expect* a reformation of the greater part of the hitherto prevalent theories about nature and the world." "I could not know (nine years ago) that the dogmata concerning *the non-existence of spontaneous generation*, and the *immutability* of Species, which were then considered almost too sacred for attack, would soon experience such severe shocks, and that the celebrated theory of Darwin would reduce the whole Organic World, past and present, to *one great fundamental conception;* I could not know that the necessary *scientific basis* [!] for either of these theories, or the *cellular* theory, would, within the same time, receive such a development as to be applicable both to the animal and to the vegetable world; I could not know that *any assertion as regards the slow evolution of* MAN, FROM AN ANIMAL FORM to his actual condition, would thus become conceivable; I could not foresee that my opinion in relation to the *silly theory of vital force* would be well supported. *Infinitely slow has been the evolution of the human mind from its primitive state.* Well does your learned countryman, Professor HUXLEY, liken the MENTAL DEVELOPMENT of humanity to the *metamorphosis of the caterpillar into the butterfly* by the periodical *castings of its skin.*" "This nature is not a chaos of incomprehensible, lawless forces, but a connected whole, subject to *eternal* laws in a constant state of *progressive development*, so that *in a lapse of time the most stupendous effects* are produced by apparently *insignificant causes;* and farther, that the universe, the suns and planets, the *wonderful organisms*, and even the HUMAN MIND in its grandest manifestations, *are* COMPOSED *of and* PRODUCED *by the* SAME MATERIALS *and* FORCES. This is a stand-point which, in magnitude and sublimity, yields to no other." "There can scarcely be a more ideal conception than the UNITY OF ALL PHYSICAL AND MENTAL EXISTENCE IN THE SAME FUNDAMENTAL LAWS AND CAUSES."

Notwithstanding the disposition of the advocates of the doctrines before us to assemble them under the general designation

of the "New Philosophy," it would appear from the great Leader that they are an old affair, derived from the Heathen of ancient nations. In the Preface to his first edition of *Force and Matter*, Büchner says—

"We do not boast of having produced *any thing new*. Similar ideas have been promulgated at all times, partly by *old Greek* and *Indian* Philosophers; but the *necessary empirical basis* furnished by modern science was wanting." Again—"The Greeks, who excelled us in many respects, knew only of departed shades; and among the Romans the belief in *immortality* was very faint."

As the foregoing is an act of injustice to the real Philosophers of ancient times, and is sinister in its purposes, I shall ultimately bring forward the principal Master Minds of those ages for their own defense against such imputations; and thus, also, contrast them with the Free-thinkers of the Nineteenth Century, and for the benefit of those who are "halting between two opinions."

Let us now inquire as to who those "Greek and Indian Philosophers" were that have transmitted to us the *materialism* and the *atheism* of the "New Philosophy." There is the old heathen HERACLITUS, who flourished five hundred years before our Saviour. He was the principal "Free-thinker" of that age. He avoided his fellow-men, and led a solitary life in the mountains; and hence was surnamed the OBSCURE. He wrote an unintelligible work on the *Nature of Things*. This work was finally lost; but there remains the following fragment:

"This Universe, containing all that exists, has been created neither by God nor by man; but has always existed, and will ever remain a *vivifying* fire, being kindled and extinguished according to *definite laws*."

There is the "New Philosophy" *in ipsissimis verbis*, in its very words; and the Author before us rejoices in that fragment, and even makes it the *motto* to the first chapter of his work. Nevertheless, as to organic beings, Dr. Büchner bestows a high commendation upon the materialistic doctrine of the organizing powers of "carbon, oxygen, hydrogen, and nitrogen," as forming "the empirical basis furnished by modern science."

Our Author, in replying to his Critics in a Preface to the third edition of his work, exposes his ignorance of Physiology and

Natural Science, and avows his *atheism* in the following manner; which is a good exemplification of the nature of his "facts" and of his method of reasoning. Thus—

"Our Critic believes that it is incogitable or impossible that the mechanical, physical, or chemical forces should have formed an eye. We might ask him, if *not these*, what else? Vital force can not be appealed to; that is *scientifically* dead. The Critic can only reply—'*Self-consciousness*, *all-penetrating divinity* has formed it.' We reply with a second question—What has formed that God? Answer—'He has either formed himself, or he is eternal.' But if so perfect a being like God *has created itself*, *why should not so imperfect* a being as the world, an organism, an eye, have been formed by its own forces? But if God is *called eternal*, *the world is also eternal*, and *this excludes* the idea of a casual principle, or renders it unnecessary. THEREFORE, *quod erat demonstrandum* —nature, with its mechanical, chemical, and physical forces, is the *producer* of the organisms. The search of Philosophers after a *first cause* is like ascending an endless ladder."

Our Author also produces the authority of Czolbe to prove that matter has always existed, and is eternal. The reader will observe that the *proof* consists in *man's inability* to create matter or to annihilate it. It will be also observed how the question as to matter is involved with the *negation* of matter or space. Thus—

"Not merely are *experimental* reasons wanting for the proof that matter and *space* have been created, or can be destroyed, but we can not *conceive* such an idea. Matter and space must, THEREFORE, be considered *eternal*."

Such, and as will be farther seen, is the general nature of our Author's facts, and such are the best examples of his logical inductions—which, indeed, is avowed by his triumphant "*quod erat demonstrandum*;" and it is such that have placed him at the head of the school of the "New Philosophy." Doubtless, however, the zeal with which he enforces its doctrines and the frankness of his atheism will render his admirers more cautious in their homage. However distasteful these quotations may be to some readers, and others that I shall have made from other authors, they are demanded by our subject, while also the reader will have extensively before him the shallow ground upon which reposes the

whole fabric of "scientific" infidelity—a basis of the most absurd assumptions.

Notwithstanding our Author introduces his first Preface with an *ad captandum* Motto from Boz—"*Now what I want is facts*"—I affirm that there can not be produced *one* substantiated "fact" in proof even of the *possible* origin of living beings through the operation of natural forces upon inorganic matter; and I shall have shown, also, the impossibility of the origin of species in any other manner than as direct acts of Creative Power. And I say, moreover, that not a "fact" can be presented in disproof of either a Soul or a Creator. I shall have considered, indeed, every so-called "fact" that has been yet submitted in behalf of either of the questions under consideration; and if this position be not advisedly taken, let its Author be confronted by the production of *the fact*. On the contrary, I reiterate, that every fact having any bearing upon the questions—and there are thousands of them—declares the existence of an organizing Principle of Life distinct from the physical forces of matter, and a substantive, self-acting Soul, and, above all, every fact relating to man and animals proclaims their origin, in a mature condition, in a Designing, Omnipotent Creator.

But we will hear our author still farther upon the subject of a Vital Force, as it is a fundamental point with the Materialist to confound the perishable Principle of Life with the imperishable forces of inorganic nature; and I also renew some quotations upon this subject, that no doubt shall exist that the violent rejection of a Vital Force is the fundamental ground for rejecting the Soul (or the "new materialism"), and of the spontaneity of living beings. Starting with the assumption that the Principle of Life is nothing but a force of inorganic matter, the assumption is carried analogically to the Soul; and then, after trampling upon the endless phenomena which attest their existence, the whole domain of Nature is thrust aside as equally wanting in proof of a Creative Power, and the analogy is thus made to subserve the assumption of the self-existence of all things. Let us hear:

"That the World has not *originated*," says Büchner, "THE DENIERS OF VITAL FORCE ARE VERY MUCH AGREED IN. As to the HOW *life originated, nothing but presumptions and hypotheses* can be offered; but these hypotheses ALL AGREE that *this origin*

proceeded from natural laws and forces *inherent* in the things themselves, and determined by external nature." Other writers will soon be quoted to the same effect.

Büchner informs us circumstantially, in his chapter on *Primeval Generation*, as to the period of time when plants and animals underwent the organizing action of the properties and forces of matter. For example—"with the appearance of water, and as soon as the temperature permitted it, *organic life developed itself;*" in which he agrees with Professor Tiedemann and others (p. 176).

The following quotation from our Author shows the bold assurance with which "Science" is invoked and misrepresented in this conflict with God and nature:

"THE FACTS OF SCIENCE," says Büchner, "*prove*, with considerable certainty, that the organic beings which people this earth OWE THEIR ORIGIN and propagation solely to the conjoined action of natural forces and materials; and that *the gradual change and development of the surface of the earth is the sole, or at least the chief, cause of the gradual increase* of the living world."

Now Science rests entirely upon *facts that have been observed by man*, and the reader, therefore, will see how completely our Author overthrows not only the foregoing statements, but his entire work, by the following admission made in another place, where he was "nodding." Here it is:

Speaking of the varieties of a common species (the dog), he goes on thus—"It is *certain* that no permanent *transmutation* of one species of animals into another has yet been observed; *nor that any of the higher organisms* was produced by the union of inorganic substances and *forces without a previously existing germ* PRODUCED BY HOMOGENEOUS PARENTS. *There must have existed individuals of the same species to produce others of the same kind.*"

Where, then, under this crushing blow of Science, inflicted by one of its principal adversaries—where, I say, are all the deformities which consist of the "organizing elements of matter," as generally taught by the materialistic school, or of Tiedemann's "primitive organic matter macerating in water;" of Darwin's "primordial form" and its development into all living beings; of the "infinitely slow evolution of the human mind;" and all other corresponding doctrines? And how well is our Author here entitled to the reproof which he administers to Professor

LOTZE of Göttingen, for a trifling contradiction of himself—"That a writer," he says, "looked upon as an authority, should pronounce in one breath two such contradictory sentences, *proves how unsubstantial our present philosophy is.*"

Let us now recur to a comparison which our author, and others of his school, have made between the *living organism* and a *steam-engine*, for the purpose intimated when I was speaking of Professor TYNDALL'S comparison of the force which moves a *clock* with that of organic beings, and other similar expedients (p. 160). The assumed analogy between them appears to have originated with Baron LIEBIG, who says, in his *Animal Chemistry*, that—"The self-regulating steam-engines furnish no unapt image of what occurs in the animal body." "The body, in regard to the production of heat and force, *acts just like one of these machines.*" Many writers have seized upon this "image," and Büchner endows it with life—

"The steam-engine," he says, "is, in a certain sense, *endowed with life*, and possesses, as the result of a peculiar combination of force-endowed materials, a united effect which we use for our purposes, without, however, being able to see, smell, or touch the effect itself." And again, in another place—"The circulation of the blood is clearly mechanical, and the anatomical apparatus by which it is effected perfectly resembles that made by the hand of man. The heart has its valves, like a steam-engine, and their closure produces audible sounds," &c. And again, for the third time, he returns to this favorite comparison of the materialistic writers; and I thus also afford them a full opportunity of displaying the best of their "facts," the best of their *logic*, and the best of their much-boasted "science." Thus, again, Büchner —"Does not the locomotive engine, as it RUSHES ALONG, appear to us as a LIVING BEING ENDOWED WITH INTELLIGENCE? Do not the Poets speak of a STEAM-HORSE—a FIRE-HORSE? It is the peculiar combination of matter and force which imbues us involuntarily with the idea that *there is life in the engine.*" And from this nonsense he immediately infers, like the rest of the school—"The possibility of the PRODUCTION OF MIND *from material combinations.* Thought, spirit, soul, are not a substance, but the *effect of the conjoined action of many materials with forces or qualities.*"

As well might a comparison be made between the mechanism of the heavens and their forces and those of Organic Beings, as between the Organic Being and steam-engines, clocks, &c., for the purpose of proving in either case that they are subject to the same forces and laws. We know that the only analogy between the inorganic and organic mechanism consists in evidences of design.

Here, then, is an opportunity for completely establishing the doctrines of materialism and atheism, or for their complete refutation; and I therefore propose the fair alternative, to wit—if any of the advocates of the origin of living beings in the forces of inorganic matter will show us that these forces can produce a steam-engine, or any thing so simple as one of its valves, they may be assured that all Vitalists, all Spiritualists, all Theists, will at once espouse their cause. And so, on the other hand, if our opponents can not thus confront us, they will be expected to acknowledge their sophistry and error.

But so long as it continues to be admitted that the steam-engine is necessarily "the work of the hand of man guided by his Reason," it will certainly follow that the contrivance of man, his Vital Force, his Intellectual Faculties, were equally the work of an Infinitely greater Designing Intelligence. And farther: considering the corresponding manifestations of Design between man and the steam-engine (mental design being admitted in the latter), the conclusion is irresistible, and sanctioned by the premises of our opponents, that the Mind of man is similar to that of his Maker. This ground being attained, it will not be doubted that the Contriver and Maker of the organic mechanism could have equally, and with great consistency, have endowed the mechanism, so different from all things in the inorganic world, with an appropriate Force of Life, and a Principle of Intelligence, a *substantive, designing, self-acting Agent* analogous to His own—just as easily, at least, as the designer and maker of the steam-engine provided the machine with "valves."

The simile of the steam-engine, however, will be abandoned hereafter; for very recently (1869) Professor FABER, of Hamburg, has actually made a *man*, who "utters words, answers questions, and even enunciates simple sentences." It is not only anatomically exact, but as Büchner *surmises only* of the

steam-engine, is actually a "living being" endowed with intelligence. This is expected to settle the question as to reasoning from the designs of man to a Creator by whom man was designed.

I shall now turn our attention to the doctrine of the "REIGN OF LAW," as designated by those who embrace the natural and the supernatural under a common philosophy. It is a happy phraseology, and admits of much ambiguity of discussion. It has engaged the attention of writers of eminent ability; but as it is only an extension of the usual materialistic rationale hitherto considered, whatever its greater plausibility and less repulsive features, it may be everywhere met by the facts and arguments already alleged against its various phases. I shall begin the discussion of this specific question by affording it the important advantage of favorable opinions derived from eminent Theologians, as the most satisfactory mode of conducting the subject. The doctrine is thus expressed by Rev. J. TULLOCH when speaking of Miracles:

"The stoutest advocate of interference can mean nothing more than that the Supreme Will has *so moved the hidden springs of nature* that a new issue arises on given circumstances."

That will do for events which are not in clear independence of Divine Power, such as are usually recognized as Providential dispensations. But there were miracles wrought by our Lord, and at other times, which admit of no such interpretation. They must be abandoned as myths if they are to be at all submitted to the test of natural laws. Our learned Author, indeed, would almost reason us into the conclusion that there is no other God than nature. "The idea of law," he says, "is so far from being contravened by the Christian miracles, that it is taken up by them *and made their very basis.*" The former part of the affirmation is strictly true, the latter as strictly untrue. "The miracles," he continues, "are the expressions of a higher Law, working out its wise ends among the lower and ordinary sequences of life and history. Those ordinary sequences (miracles) represent nature, however, not as an immutable fate, but a plastic medium through which a Higher Voice and Will are ever addressing us, and which, therefore, may be wrought into new issues when the Voice has a new message and the Will a special purpose for us."—*Beginning Life*, &c.

It is certainly true that miracles sometimes imitate natural events, as in the miraculous hail, when the instrumentality of natural laws may be employed; but in all the cases there is as much a direct and manifest exercise of Creative Energy. In most of the miracles, however, we witness nothing of the "ordinary sequences of nature." What analogy is there, for example, between the resurrection of Lazarus, the conversion of water into wine, the miracles of the loaves and fishes, &c., and any of the sequences of the laws of nature; or with what reason can it be said that "the idea of law is made the very basis" of such miracles? The statements above refute the assumption. The doctrine inculcated by Tulloch in the foregoing extract is virtually the dogma of the Correlation or Equivalence of Forces, which recognizes no other Will, Intelligence, and Creative Power, as I have already variously shown, than what emanates from matter. "*Plastic nature*," therefore, means simply *creative nature*, whose God consists of the forces wherewith it is endowed.

The Rev. J. Pye Smith, in his work on *Geology*, introduces the authority of the Rev. Professor Sedgwick, as follows:

"The Rev. Professor Sedgwick has favored me with communications on this vital point (perpetual change of plants and animals), and with permission to use them as I might think fit. Among his remarks the Professor says—'The fossils demonstrate the time to be long, though we can not say how long.' 'Every thing indicates a very long and very slow progression —*one creation* flourishing and performing its part, and gradually dying off as it has so performed its part; and *another actual creation of new beings*, NOT DERIVED AS PROGENY from the former, gradually taking its place; and again this new creation succeeded by a *third*. Nothing *per saltum;* all according to Law and order; all bearing the impress of Mind, a great dominant *will*, at the bidding of which *all parts of nature* have their peculiar movements, their periods of revolution, their rise and fall.'"

Another late and distinguished writer, the Duke of Argyll, on the "*Reign of Law*," presents the subject in an elaborate manner. The work involves all the questions which will have come before us of a materialistic nature, and more than any other is intended to elucidate their philosophy. It is truly a representative work, and must, therefore, receive a critical attention before ad-

vancing farther to those Authors who have built up creation upon the same foundation. Moreover, the discussion will have so far covered the ground that the necessity for criticism upon the writings of others of the same school, to which I shall refer, will be greatly superseded. Their premises and conclusions being presented, can be readily brought to the test of what I am about to say and have said already. Whatever may have been our Author's intentions, his work is apparently an attempt to render materialism and pantheism acceptable; and the task is executed with an ability and plausibility much surpassing any similar effort. I approach it, therefore, with no little diffidence, and as a necessary part of my undertaking. Numerous quotations will be made, not only for the reader's information and in full justice to the Author, but as supplying one of the best opportunities for a comparison of facts and arguments upon important questions. I begin with the *modus operandi* of Creative Power. Thus our Author—

"There is nothing in Religion incompatible with the belief that all exercise of God's power, *whether ordinary or extraordinary*, is effected through the instrumentality of means—that is to say, by the instrumentality of natural laws brought out, as it were, and used for a Divine purpose. To believe in the existence of miracles we must, indeed, believe in the Superhuman and in the Supernatural. But both these are *familiar facts in nature.* We must believe, also, in a Supreme Will and a Supreme Intelligence; but this our own Wills and our own Intelligence not only enable us to conceive of, but compel us to recognize in the *whole laws and economy of nature.*"

The foregoing is presented with much ingenuity, since it is virtually a reduction of miracles to the ordinary laws and economy of nature. What is meant by "Supreme Will and Supreme Intelligence" in this connection will be explained by our Author himself in subsequent quotations.

I have said that M. GUIZOT, in *L'Eglise et la Société Chretienne* (1861), has employed the argument set forth by myself in my work on the Soul and Instinctive Principle, in 1848, and again in my work on Theoretical Geology, in 1856 (which were then widely distributed in Europe), to the effect that man must have been created in a state of maturity both of body and mind; and

which I extended, at the same time, to all mammiferous animals, and all birds whose young are at first incapable of flight. The argument in relation to man, as briefly stated by M. GUIZOT, is bravely evaded by the DUKE OF ARGYLL by the assumption of "*many successive creations* in the history of our Planet," according to the Reign of Law. Thus the Duke, after referring to Guizot's opinion—

"This is not a very safe argument. If the *Supernatural*—that is to say, the *Superhuman* and the *supermaterial*—can not be found *nearer to us than this*, IT *will not be securely found at all.* It is very difficult to free ourselves from the notion that, by going far enough *back*, we can '*find out God*' in some sense in which we can not find him *now*. *The certainty* not merely of one, *but of many successive Creations* in the history of our Planet, and especially of a time comparatively recent, *when man did not exist*, is indeed an effectual *answer to this notion*, if it be now ever entertained, of '*all things having continued as they are since the Beginning*' (2 Peter, ch. iii., v. 4). But those who believe that the *existing* processes of nature can be accounted for by 'Law' may *as reasonably believe that those processes were* COMMENCED *by the same vague and mysterious agency.*"

Here we have the assumption which is equivalent to saying that, as there have been many successive beginnings and extinctions of living beings upon our Planet under the "Reign of Law," and they came forward in very immature conditions, *therefore* this is "an effectual answer" to the argument that man was created in a state of maturity. Since, however, our Author thought proper to introduce the incontrovertible proof that man was, from the very necessities of the case, created in a state of maturity both of body and mind (see Chap. VII.), it was incumbent upon him, in deference to the argument and its object, to have treated it with something better than contempt. The affirmation that, "If the *Supernatural*—that is to say, the *Superhuman* and the *supermaterial—can not be found nearer to us than this*, IT *will not be securely found at all*," is equivalent to saying, in view of the demonstrative fact, that we may abandon all other efforts at "looking through nature up to nature's God," and repose all our faith and our hopes in the sensible objects around us. Our Author's disposal of the subject in the foregoing manner is too mo-

mentous to admit of a silence on the part of its original propounder that might be regarded as an acquiescence; and many might consider the sophistry unanswerable, and a final disposal of the great questions between the Spiritualist and the Materialist, the Theist and the Pantheist. And what can be more defiant of facts, or a more direct delegation of the origin of organic beings to the forces of inorganic nature, than the following assumption that such beings are still undergoing creation?

"The work of *creation* has been and *is being carried on under rules of adherence to typical forms*, and under limits of variation from them," &c. And again—"The close and mysterious relations between the mere animal frame of man and that of the lower animals does render the idea of a *common relationship, by descent* at least, conceivable. Indeed, in proportion as it seems to approach nearer to processes of which we have some knowledge, it is, in a degree, more conceivable than Creation *without any process—of which we have* NO KNOWLEDGE, *and can have* NO CONCEPTION. BUT WHATEVER MAY HAVE BEEN THE METHOD OR PROCESS OF CREATION, IT IS CREATION STILL. If it were proved to-morrow that the first man was 'born' from some pre-existing Form of Life, it would still be true that such a birth must have been, *in every sense of the word, a new Creation.* It would still be as true that God formed him 'out of the dust of the earth,' as it is true that he has so formed every child who is now called to answer the first question of the theologians. [Mere sophistry.] And we must remember that *the language of Scripture nowhere draws, or seems conscious of, the distinction* which modern philosophy draws so sharply between the Natural and the Supernatural"—which is simply a misrepresentation of the Narrative of Creation.

And, again, our Author confounds in a similar manner the original creation of living beings out of the *elements* of matter with their perpetuation by means of the sexes. Thus—"Out of the dust of the ground, that is, out of the ordinary elements of matter, was that body formed which is still upheld and perpetuated by organic forces acting under the rules of law." Nothing truer; but our Author continues—"On this subject M. GUIZOT lays great stress, as many others do, on what he calls the SUPERNATURAL in Creation as *distinguished from the operations now visi-*

ble in nature." And still again—"The *truth* is, there is *no such distinction* between what *we find in nature* and what we are called upon *to believe* in Religion, as that which men PRETEND *to draw between the Natural and the Supernatural.* It is a distinction purely *artificial*, *arbitrary*, and *unreal.*"

The foregoing quotations are derived from our Author's introductory chapter on the "Supernatural," which appear to be intended as a basis for the subsequent part of the work which treats of the "Reign of Law." What that "Reign" is, the reader can well imagine—more distinguished for sophistry than the logic of facts. Indeed we look almost in vain for the semblance of facts; and surely what we have thus foreseen of our Author consists of assumptions that strike at the foundations of nature, as I have already presented them in their absolute and indisputable realities, and which I shall continue to substantiate by other irrefutable proofs. And yet, as I have said, this work of our Author is so constructed that it occupies the first rank among its competitors.

> "'Tis time, however, if the case stands thus,
> For us plain folks, and all who side with us,
> To build our altar confident and bold."

But we will hear the Duke yet farther, who carries the foregoing principles into the laws of nature, investing the laws with that Will and Intelligence which belong to their Author. This is the doctrine of the Pantheist. He has here no alternative. He must speak of mind, reason, intelligence, will, affections, &c., in the language which common usage has adopted, or he would not be intelligible or obtain a hearing. "It belongs," as our Author would say, "to the profound but unconscious metaphysics of human speech." He therefore assigns those Divine attributes to the laws of nature; and nature, in a collective sense, is the god of pantheism. In the same way, and for the same reason, the operations of the Soul are expressed in Materialism after the manner of the Spiritualist; and when Life is the subject of consideration by the same school, by which nothing more is meant than "correlated heat," the phraseology is that of the vitalist—vital force or a plastic force being the usual verbal medium through which the writer makes himself intelligible. The treatment of the subject has often an air of plausibility, and when

presented with scientific pretensions it is fruitful of victims. Let us hear our Author, the Duke. Thus—

"The very idea and essence of a *machine* is that it is a contrivance for the distribution of *force* with a view to its bearing on special purposes. A man's arm is a machine in which the law of leverage is supplied to the vital force for the purpose of prehension. Anatomy supplies an infinite number of similar examples. It is impossible to describe or explain the facts we meet with in this or in any other branch of science without investing the LAWS OF NATURE with something of that personality which they do actually reflect, or without conceiving of them AS PARTAKING OF THOSE ATTRIBUTES OF MIND which we everywhere recognize in their workings and results." "Sir JOHN HERSCHEL has not hesitated to say—'That it is but reasonable to regard the Force of gravitation as the direct or indirect result of a CONSCIOUSNESS or a WILL *existing somewhere.*' And even if we can not certainly identify Force in all its forms with the direct energies of One omnipresent and all-pervading Will, it is at least in the highest degree unphilosophical to assume the contrary." "It is perfectly true that the mind does recognize in nature a reflection of itself. But if this be a deception, it is a deception which can not be avoided by *transferring the idea of Personality to the abstract idea of Force.*"

What has been just stated of Sir John Herschel is affirmed in the same manner of the Vital Force by the distinguished Dr. PRICHARD. Thus—"We may, if we choose to do so, term the cause which governs the organization and vital existence a *plastic principle;* but it is a principle *endowed with intelligence and design.*" And what but the Will of *nature* can be meant by our Author, the Duke, in the following speculation upon the Correlation or Equivalence of Forces?—"It may be," he says, "that all natural forces are *resolvable* into some *one force*, and indeed, in the modern doctrine of Correlation of Forces, an idea which is a near approach to this has already entered the domain of Science. It may also be that *this one force*, into which all others return again, *is itself a mode of action of the Divine Will.*" Nor has "Sir John Herschel hesitated to say" that—"*Organic nature is the mystery of mysteries;*" nor has our Author "hesitated to say" that—"It is the *completeness of the analogy* between our own

works on a small scale and the works of the Creator on an infinitely large scale, *which is the greatest mystery of all.*" Grant a Personal God for the latter, where, then, is the "mystery" in either case? And associated with that "complete analogy," here is another obvious truth from our Author which should impel us at once to look through the designs of Reason to a Higher Intelligence as the Architect of nature—"All our machines are simply contrivances for bringing natural forces into operation; and these machines themselves we are able to construct only out of the materials and by the application of the laws of nature."

Our Author's work, like Darwin's on the "*Orchids*," abounds with evidences of Design in nature. As to the Laws of *inorganic nature*, and as their operation is expounded by our Author, no one acquainted with them entertains a doubt, excepting in respect to their imputed creative endowment.

Our Author, however, certainly knows nothing of the laws of organic beings, but regards the successive geological creations as established. The mechanism of flying, of which he gives us many examples, and all analogous phenomena which are relative to the acts of volition and the senses, have nothing to do with *the Laws of Life*, however much, as they wonderfully are, significant of an Almighty Designer—*Something beyond nature itself.* To appreciate in the least the laws of life, we must penetrate the profound labyrinth of the real organs of life, and there we shall find, also, what our Author and Theoretical Geology labor to prove by the skeleton and its external appendages, that not only the whole animal kingdom, but the vegetable also, are constituted upon one plan of organization, functions, and laws. Theoretical Geology, like our Author, takes no account of those numerous tribes of animals which have no skeleton and often no external appendages, and where the unity in the general plan of organization can be detected only in the fundamental laws of life—as, for example, in the *polypi;* but it lays its foundation of unity of plan upon what is merely *superadded* in animals to the organic mechanism, and this for the special purpose of rearing up its hypothesis of a "typical plan," or an ascending series of so-called creations according to the immutable laws of nature. After an extended, able, and instructive account of the mechan-

ism of flying, swimming, plumage, &c., our Author generalizes the whole after the manner of Theoretical Geology. Thus—

"On this plan ['an *universal* plan'] the bony skeletons of all living animals have been put together [excepting such as have none]. *The forces* which have been combined *for moulding* the organic forms have been so combined as to mould them after certain *types or patterns.* And when comparative anatomy has revealed this as affecting all the animals of the existing world, another branch of the same science comes in to conform the generalization and extend it over the innumerable creatures which have existed and passed away. This one plan of organic life has never been departed from since Time began."

But it is all relative to the animal or non-essential appendages of organic life, whose plan *only follows* upon the immensely greater and universal plan of the essential organs. (See "Typical Plan," p. 215.) And then our Author, after the manner of the disciples of nature, informs us how the universal typical system has been accomplished; and this he does in a chapter whose very title is intended to convey its whole import—that is, "CREATION BY LAW." Thus—

"It appears that creative purpose has been effected through the instrumentality of FORCES so combined as to ARRANGE THE PARTICLES OF MATTER *in definite forms*—which is simply nature's 'creative purpose.'" (See Chap. VII.) Again—"*Each new creation* seems to have been *a new application of the old materials; each new house of life* has been built on these new foundations." "*Creation has not been a single act, but a long series of acts*—a work CONTINUOUSLY PURSUED through an *inconceivable* lapse of time." "In almost all the leading Types of Life which have existed in the different geological ages, there is *an orderly gradation*, connecting the Forms which were becoming extinct with the Forms which were *for the first time* appearing in the world." "The *introduction of new species*, to take the place of those which have passed away, is a work which has been not only so often, but *so continuously repeated*, that it does suggest the idea of having been *brought about through the instrumentality of* SOME NATURAL PROCESS. But we may say with confidence that it must have been a process *different from any that we yet know*, a process not the same as that, obscure as this is, which produces the lesser modifications

of organic forms"—and which, if true, would violate the "typical system" and "unity of design."

It is all the work of the blind forces of nature. But the foregoing statement supposes a mutability of the laws of nature, so far as necessary to meet exigencies in pantheism; and in the case before us it is without a shadow of ground for its justification. But says our Author:

"IF *there were* any evidence that by the same means new forms of life could be *developed from the old*, I can not see why there should be any reluctance to admit *the fact*. It would be different from any thing that we see, but I do not know that it would be at all *less wonderful*, or that it would bring us much *nearer* than we now stand to the *great mystery of Creation*. It can only be due to the working of *a power* which is in THE NATURE OF CREATIVE POWER."

We will now give our Author a respite, and listen to Dr. S. L. METCALFE, who is one of the many disciples of our Author's school. In his work on *Caloric* (1843) there appears one of the earliest attempts to identify the forces of nature, and in which he reduces all of them to the condition of *caloric*. Nay, more; he affirms that—"The truth is, that elementary fire is *the only appropriate representation of the Divinity;* because it is everywhere present, and performs every operation in the physical universe"—the prevailing "scientific" doctrine. And METCALFE shall also tell us what is meant by "Creation by Law," and investing nature with Intelligence and Will. He quotes several distinguished modern Divines as having "maintained that God is the *immediate* cause of all the mechanical, chemical, and vital operations of nature—a doctrine which is *wholly irreconcilable* with the METAPHYSICAL NOTION of an *immaterial* and superessential First *Cause.*"* He thinks, too, as to the origin of living beings out of

* This is the most dangerous of all the pantheistic modes of representing the government of the operations of nature; for it identifies the laws and forces of nature with the God of the Theist. And who shall calculate its deplorable effects when advocated by such eminent Theological writers as are summoned by Dr. Metcalfe in his behalf—such as, "Dr. Cudworth, Dr. Baxter, Samuel Clark, Dr. Dwight, and many other distinguished Divines, including the present Bishop of London and Mr. Whewell; and in defending it, Baxter, Clark, and Dwight reason very much in the same way as did Thales, Pythagoras, Heraclitus, Anaxagoras," &c. I had occasion to speak of this doctrine in the "Institutes of Medicine," more than twenty years ago, in the following manner:

the elements of matter, and through the forces of inorganic nature, that "there is nothing more mysterious in this than in the ordinary process of generation, *only that we are more accustomed to the latter.*" But is the former as well supported by facts and the laws of nature as the latter? (See Chap. VII.) The learned Doctor, however, is more perplexed than our Author, the Duke, as to the re-appearance of animals and plants to supply the places of such as may become extinct. Upon this curious point, which is at the basis of Theoretical Geology, he remarks that—

"It would doubtless be interesting to know whether, if *all the plants and animals* that now inhabit the earth *were destroyed*, similar orders, tribes, and families would gradually arise, in obedience to *existing laws*—whether the *higher* orders began their existence in a *very simple* state, and *gradually advanced* from one stage of development to another, as the recent discoveries in Ge-

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It is assumed by many late physiologists, as Drs. Carpenter, Prichard, &c., after admitting and denying the existence of the vital properties, and contending for their existence in the elements of matter, and the organizing agency of the forces of chemistry, that, nevertheless, all the results of organic beings are owing to the immediate acts of the Almighty. This, therefore, as with the author of the "Vestiges of Creation," is only a circuitous method of confounding nature with God. Let us, however, suppose that there is a Supreme Being in their opinion, who is the Author of nature, and that He is the Power who presides in organic beings, and regulates all their processes, and we shall see that it abounds with absurdities. Its advocates generally carry this sophistry so far as to affirm that the particles of matter are constantly maintained in union by Almighty Power, that chemical affinities are nothing but manifestations of that Power, that gravitation is only a constant emanation of the Deity; that digestion, circulation, secretion, excretion, &c., are only immediate acts of God. It is plain, therefore, that they can allow no other God than nature.

But let us now look physiologically at this pantheism. Organic beings are made up of matter, which, it will be conceded, is distinct from God, if we allow His existence as distinct from matter. It is, therefore, perfectly consistent to suppose that this matter is endowed with distinct forces for its own government. If we regard, next, the results of vital stimuli, we have a palpable proof that they elicit actions and physical results through principles which possess the power of acting, or we must take up the absurdity of supposing that they act on God himself. The same may be affirmed of the poisons, medicines, &c. But this will not hold, either in Religion or philosophy. Nevertheless, it is evident that some active agent is brought into operation. If stimulants are applied to the nose, the heart may be thrown, on the instant, into increased action, or sneezing may follow. Of course, it can not be entertained that God is the agent acted upon in such a case, any more than when prussic acid destroys life with the same instantaneousness, and, therefore, He can not be assumed as the cause of the healthy and natural functions.

ology would seem to indicate—*why* it is that, among all the higher animals, nearly *an equal number of the two sexes were produced*, —*whether* THE ORGANIZING PRINCIPLE *is both male and female*, as supposed by the ancient Hindoos and Egyptians, among whom it was represented by the *Phallus* and a *Triangle*, or generative organs of the two sexes."

"Whether the *organizing principle* is both male and female." What a contrast is here with the Divine statement that—"Male and Female created He them."!! I know of no writer since the time of "the Hindoos and Egyptians" who has attempted an explanation of the last of the foregoing "mysteries." And yet every project of "Creative Law" means exactly what is here expressed—a Law endowed with a Sexual Organizing Principle—worthily represented under the symbols of the *Phallus* and a *Triangle*. But our learned Doctor is about the only modern who has ventured to advert to the subject. There is too much of a complicated mechanism—too various in the different sexes, and in each individually—too universal throughout the animal and vegetable tribes—too much evidence of various and wonderful Design and of Unity of Designs—too much of a positive indication that the sexual institution is the only method of producing living beings—too many absurdities attending any other theory —too much proof in the *mammary gland alone* to admit even the conjecture that man and mammiferous animals were not created in a state of maturity both of body and mind—too much, I say, of all these multifarious Designs, all concurring together, and forcing us into the immediate presence of a Personal Creator—too much of them to allow the Advocates of the origin of living beings in "a Creative Law of Nature" to even hint at the difficulties, although considered worthy of a "scientific" solution by their predecessors, "the Hindoos and Egyptians." Our learned Doctor stands alone in braving this universal voice of Nature since the days of "*the Phallus* and *Triangle*." Even Darwin, who starts with "a primordial form," and others with a "cell," or a "blastema," have no better chance of escape from the crushing facts than they who begin with the elements of matter; for none of them have ventured to assume that their primordial form embraced "the organizing principle of both male and female." They are all, indeed, very silent upon the manifold ob-

jections to the developmental hypotheses, and present us with mere assumptions. But let us not lose sight of the *Phallus* and *Triangle!*

The DUKE OF ARGYLL, to whose work on the "Reign of Law" I now return, supplies a very accurate view and criticism of Darwin's hypothesis, from which it will be seen, also, wherein their developmental doctrines fail of full agreement. Thus the Duke—

"Mr. Darwin does not pretend to have discovered any law or rule according to which new Forms have been born from old Forms. He frankly confesses that 'our ignorance of the laws of variation is profound,' and says that, in speaking of them as due to *chance*, he means only 'to acknowledge plainly our ignorance of the cause of each particular variation.' Again he says—'I believe in no *Law* of necessary development.' This distinction between Mr. Darwin's theory and other theories of Development has not, I think, been sufficiently observed. His theory seems to be *far better than a mere theory—to be* AN ESTABLISHED SCIENTIFIC TRUTH, [!] in so far as it accounts, in part, at least, for the success and establishment and spread of new Forms *when they have arisen*. But it does not even suggest *the law* under which, and by which, or according to which, such new Forms *are introduced*. Natural selection can do nothing except with the materials presented to its hands. It can not select except among the things open to selection. Natural selection can originate nothing. It can only pick out and choose among the things *which are originated by some other law*. Strictly speaking, therefore, Mr. Darwin's theory is not a theory of the origin of species at all, but only a theory on the causes which lead to the relative success or failure of such new Forms as may be born into the world."* "I

* Professor OWEN, in his work on the "*Anatomy of Vertebrata*," in stating the distinction between the Laws of "Derivation" and "Natural Selection," remarks that—"'*Derivation*' holds that every species changes in time, by virtue of inherent tendencies thereto. '*Natural Selection*' holds that no such change can take place without the influence of altered external circumstances educing or selecting change." "Those who hold to the 'pre-existence of germs' maintain that they are transmitted, sometimes becoming developed, sometimes lying dormant from generation to generation, as descendants of '*one form* of Natural Selection,' into which life was first breathed. Darwin grafts upon this modification of the old *evolutional* dogma his provisional hypothesis of '*Pangenesis.*'"

dwell on this, because it lies at the very root of the question, how far Mr. Darwin's theory can be said to suggest any thing *in the nature of Creative Law* OF A KIND TO EXPLAIN THE METHOD which has been followed in the introduction of new species."

That is the difference between the two rival Schools of Creation. Our Author has a "Creative Law" without "explaining the method;" while Darwin assumes the development of species without a Law. Darwin's hypothesis has also a primordial form, a blastema or a cell, at least, out of which his *ipse dixit* develops all organic nature; while our Author and his school start with the elements of matter, and thus give to each species an independent origin. The analogies of organization among animals are a great help to Darwinism, and constitute its "Law" of development, with the aid of "time enough," and it only halts at the advent of man. But even here Darwinism is in diligent search of the animal out of which man was developed, and its projector does not doubt that, as he says—"Light will be thrown on the origin of man and his history."* He has, moreover, an expectation that something will yet be "developed" that will show how the human mind was as much a matter of progressive evolution as the body itself, and believes that—"*In a distant future physiology will be based on a new foundation*, that of the necessary acquirement of early mental power and capacity *by graduation*." But Darwin's great argument, by which he defies all contradiction, is this—"*It can not be proved*," he says, "that the amount of variation in the course of *long ages* is a *limited* quantity. *The mind can not grasp* THE FULL MEANING *of a hundred millions of years*." In short, Darwin's hypothesis scarcely differs from that of LAMARCK. The latter supposes that there is an inherent prin-

* Since the foregoing was in the hands of the printer, DARWIN'S work on the *Descent of Man, and Selection in Relation to Sex* (1871), has made its appearance, in which "light is thrown on the origin of man," harmonizing with our Author's general doctrine of development. But it will be seen that its contents have been fully anticipated.

The copious verbiage in relation to "sexual selection" is the merest product of imagination, of which its special embellishment is the gay plumage of birds. Language is exhausted upon the feathers. There is nothing of recognized fact or of organic science as the basis of the doctrines inculcated in this new work; and what has been said in the present, and in Chapters VI. and VII., covers the entire ground occupied by the work on the "*Descent of Man.*"

ciple in every species of animals and plants by which, through long lapses of time, and various agencies, they are developed into other species; and he has a circumstantial account of the methods by which the Orang-Outang was developed into the human species. Lamarck's doctrine will soon be farther stated.

The more we interrogate our Author, the Duke, the more we shall find him evading the "*method*" of Creation by Law, till finally, as in Darwin's case, he avows that he knows nothing about it. Thus, again, our Author—

"Particular Forms of Life have attained, *at particular epochs, a maximum development* both in respect to size and distribution —the FAVORITES, as it were, *of Creation* FOR A TIME."—But favoritism in such an "universal plan" will scarcely consist with "Creation by LAW," much less with the Creator's Unity of Design. But let us hear our Author a little more particularly as to the part which a Personal Creator has had in the production of living beings, and the "*method* of Creation by Law." He says that—

"If I am asked whether I believe that every separate species has been a *separate creation*—not born, but *separately made*—I must answer that I do not believe it. I think the facts do suggest to the mind the idea of the WORKING OF SOME CREATIVE LAW *almost as certainly as they convince us that* WE KNOW NOTHING OF ITS NATURE, *or of the* CONDITIONS *under which* IT DOES ITS GLORIOUS WORK."!!

The foregoing quotation scarcely requires any farther comment than that by which it was introduced. There is no Personal Creator; and as "Creative Law" has been operating "through an inconceivable lapse of time," beginning with the lowest forms of organic beings, and advancing in an ascending series "*in an* orderly gradation" till a "maximum development was attained," there has been, of course, no creation whatever by a Personal Deity. But what is the meaning of this "Creative Law?" It necessarily means that there is a disposition in inanimate matter to assume the conditions of animated beings, attended by a development of Vital Properties and Laws that are peculiar to living beings—utterly different from the Laws of inorganic nature under which it is assumed that the Living Beings and their Laws came into existence. But that is not the worst of this "philoso-

phy;" for, of course, it assumes that the Mind must have had a corresponding origin, and, therefore, that the so-called Soul is either merely a property or a product of matter. Our Author's doctrine of "Creative Law" is, therefore, precisely that of the School who advocate the origin of Living Beings in the elements of matter through their inherent properties; the absurdities of which I have already sufficiently demonstrated. (See particularly Chap. VII.)

As nature abounds with evidences of Design, it is necessarily invested by the advocates of spontaneity of living beings with a Will and Intelligence; and under this cover the credulous or unreflecting are betrayed into the belief that a Higher Power than nature is thus, in some obscure manner, implied. But nowhere does our author, or others of the developmental Schools, when speaking of Living Beings, recognize a Creator distinct from nature. Our author says that—

"The pretended separation between that which lies *within nature* and that which lies *beyond nature* is a dismemberment of the truth. Let both those who find it difficult to believe in any thing which is *above* the natural, and those who *insist* on that belief, FIRST *determine how far* the natural extends." "Above and behind every detected method in nature there lies the same ultimate question as before—WHAT IS IT *by which this is done?* It is the great *mystery* of our being that we have powers impelling us to ask such questions when we have no powers enabling us to solve them. It is probable that the *nearest methods* of Creation, though far short of ultimate truths, lie behind a veil too thick for us to penetrate."

So far from "having no powers enabling us to solve" the origin and existence of all things, it is totally an unfounded assumption. We know with the most absolute certainty that living beings were created by a Being as Personal as ourselves, with the same Designing and Constructive Powers—only extended to Infinity. We know this through the unending, precise, and complex Designs in all organic nature. If we have no difficulty in understanding that the "steam-engine," which is so much admired in materialism, was the production of Mind, surely there can be as little in representing as clearly to ourselves a Personality of Mind as the Author of a being so "fearfully and

wonderfully made as man," who has himself been capable of constructing a machine which is often compared by the Materialist to the human mechanism. Nor may Pantheism prevaricate by assuming that in the latter case we call up the material image of the man as the subject of our conceptions; for it is entirely astray from the truth. On the contrary, we do not think in the least of the hands or the hammer that fabricated the machine, but of the *mind alone* that contrived it. By those same "powers which impel us to ask such questions" we also arrive at a certain knowledge that the Being who brought the elements of matter into the organic conditions of His living creatures could have had no greater difficulty in bringing the elements themselves into existence — and that, too, "*ex nihilo*." Whatever is in opposition to this is merely an ambitious attempt to place the human understanding "behind a veil too thick for us to penetrate."

"Creative Law" is the fundamental principle of all the hypotheses of development, and the "Reign of Law" is the administration of the code under which the developments are conducted. But I have variously and extensively demonstrated, both by specified facts and the soundest principles of all the natural sciences, that every developmental hypothesis, and the "Reign of Law" in its application to the origin of living beings, are in absolute conflict with the facts and laws of nature; and these laws are allowed by all to be immutable.

But our *representative* Author, the Duke, shall have the fullest justice, and in his own words—always so, indeed. Here is a comprehensive statement which covers the whole delusive system of Pantheism, and in the most appropriate language. Thus our Author, agreeing fully with my interpretation of "Creative Law," and in full consistency with himself—

"Creation by Law—Evolution by Law—Development by Law, or, as *including* all those kindred ideas, the *Reign of Law*, is nothing but the Reign of CREATIVE FORCE directed by Creative knowledge, worked under the control of Creative Power, and in fulfillment of Creative purposes."

Or take the words of another eminent writer, the Rev. Professor WHEWELL, who holds the same doctrine as the Duke, and who is one of the "distinguished Divines" to whom Dr. Met-

calfe refers (page 238); and let us show, by a simple syllogism, that the doctrine ignores a Personal Creator. Thus says Whewell, in his Bridgewater Treatise—

"We infer that the intelligence by which the law is ordained, the *power* by which it is put in action, *must be present at all times* and in all places *where the effects* of the law occur; that thus the knowledge and the *agency* of the Divine Being pervade every portion of the universe, *producing all action, all phenomena and change. The Laws of Nature* are the *laws which He, in his wisdom, prescribes to his own acts; his universal presence is the necessary condition of any course of events, his universal agency the only origin of any efficient force.*"

Such, then, with our Rev. Professor, and all others of the school of "Creative Law," are the premises and the conclusion. That is to say—

"*Nature is governed by laws. The laws of nature are the laws which the Divine Being prescribes for his own acts, and his agency produces all action.*" *Therefore, the laws of nature are the Divine Being.*

That the Creator maintains a control over His second causes and the laws by which they are directed, no one can doubt who believes in their supernatural origin, although they are so ordained as to operate independently of the Creator's direct interposition. Nevertheless, the belief is also avowed by all who offer prayer to the Supreme Being, and in the sincerity which is so implied, that He does interpose His influence in giving a special direction to those causes when special ends are to be fulfilled which would not ensue without such interposition, and which does not interfere with their general operation; and they believe, also, that the Creator has determined events, as in the case of miracles, either by extraordinary co-operation with second causes, or in perfect independence of them. But this is a very different view of the subject from that which supposes the Creator to be the *efficient* cause of events in the general operations of nature, (instead of His second causes and laws)—that it is He "who produces all action and passion, and that His agency is *the only origin* of any efficient force." Even in respect to the organization of the earth, as I shall endeavor to show (Appendix I.), He simply co-operated with the properties and laws which He had im-

pressed upon matter; and here we witness a clear demonstration, in the effects of the united action, of that which was the result of Creative Energy and that which was delegated to second causes. When the work of Creation was completed, we have every reason to suppose that the laws which relate to the physical constitution of inorganic and organic nature became established substitutes for Creative Energy, and that they effect their results without any direct instrumentality of the Divine Being. All our Sciences are built upon this foundation, not upon conceptions of Divine action. The apparent exceptions, known as miracles and Providential interpositions, have strictly a reference to the moral government of responsible beings, and these neither enter into our scientific calculations, nor do they in the least interfere with them. Therein may be seen the distinction between government by established laws and government by Divine action. Nor is there in the latter case any "suspension of the laws of nature," according to the usual phraseology; nothing but a Divine interposition to bring about a particular event that relates to man alone. If the miracle in the Valley of Ajalon, when the sun and the moon stood still, was owing to a suspension of the earth's revolution upon its axis, there was not a suspension of a law of nature, for the law was elsewhere in universal operation. It simply involved the same abstract exercise of Divine Power as was concerned in the general Deluge, or in the resurrection of Lazarus, or in other miracles. They are the strongest examples, also, of the only direct agency which the Creator has manifested in the events of the natural world. All else has been committed to causes substituted for Creative Power, and the laws under which they operate. This is the dictate of all the facts upon which the Sciences repose, and of what is observed of the moral government of the human race. Laws have been established in Astronomy, chemistry, the economy of organic beings, which have not been contradicted by any phenomenon. The distinction between the great system of natural laws and the partial deviations in behalf of the instability and imperfections of human reason and human affairs appears to be strongly pronounced. It is the latter about which Religion is concerned.

As to *second causes*, the Pantheistic School studiously avoid the term, for that would imply a First Cause. It is always the

"laws of nature," or a "creative law," or a "creative force," which are used as convertible terms. It is like the modern school of "Spiritualism," of which Professor Phelps, of Andover Seminary, remarks, that—"In another of its tangents, it flies off in a *deification* '*of the forces of nature, called God.*' Excuse us, gentlemen, whatever else this may be, it is not Religion." Pantheism necessarily invests the forces of nature with Divine attributes—such as "Creative knowledge" and "Creative purpose." Our Author, the Duke, affirms that—"It is impossible to describe or explain the facts we meet with in any branch of Science without investing the Laws of Nature with something of that personality which they do actually reflect, or without conceiving of them as *partaking of those attributes of mind* which we everywhere recognize in their working and results." Our Author even brings to his support the Prophets of old—

"They never revolt," he says, "as so many do in *these weaker days*, from the idea of Divine Power working by wisdom and knowledge in the use of *means*—[very true, excepting in many cases of miracles]; nor, in this point of view, do they ever separate between *the work of the first Creation* and the work which is *going on daily* in the existing world"—which is very untrue, as is attested by the whole Narrative of Creation.

The Scriptures simply inculcate the fact in relation to the daily events of the existing world, that the Creator maintains His Power over the laws which he ordained at the era of Creation, and that He is Omniscient and Omnipresent. Moreover, in the original Creation, when God launched the universe into being, the only means at His command was His Own Creative Energy. Until then He had no "materials" for the construction of living beings; and when they were organized, it was equally an act of Creative Energy, excepting the elements of matter of which they are composed, and which had been already created—*ex nihilo.* Our Author, however, says—

"I do not know on what authority it is that we so often speak as if Creation was not Creation, unless it works *from nothing as its material* and by *nothing as its means.*"

That involves the eternity of matter; which, in connection with the origin of living beings through the instrumentality of the forces of inorganic nature, is the very worst aspect of panthe-

ism. The believers in a Personal God, sustained by all that is known of nature, by all its laws, and forces, and facts, can have no compromise with the doctrine. But our Author, the Duke, continues thus—

"We know that 'out of the dust of the ground'—that is, out of the ordinary elements of nature—are our bodies formed, and the bodies of all living beings. Nor is there any thing that should shock us in the idea that the *creation of new Forms*, any more than their *propagation*, has been brought about by the use and instrumentality of means."

Now our Author must surely know that there is no *analogy* whatever between the creation of living beings out of the "elements of nature" and their "propagation" by means of the sexes. There can, therefore, be no reasoning from one to the other. But such is the delusive nature of the "Reign of Law" when aiming at its indiscriminate application, and especially at its substitution for a Personal Creator. Nor does our Author derive the most slender support from his quotation from Professor OWEN, who rejects, in his "*Palæontology*," the interposition of Divine Power, when he says that—"We discern no evidence of *pause* or *intermission* in the *creation*, or COMING-TO-BE, of new plants and animals;" since the affirmation is not only positively contradicted by the laws of nature, and by the established modes of propagation throughout the animal and vegetable kingdoms, but by all human observation. (Owen's doctrine will be farther quoted in Chapters X. and XIII.). We have also from the Duke, as we have seen of others, an analogical deduction from the structure of *crystals* as to the possible origin of living beings in the forces of nature. Thus—

"In the inorganic world we know that not mere similarity, but absolute identity of forms—as in *crystals*—is the *result of laws* which have nothing to do with *Inheritance*, but of *forces* whose nature it is to aggregate the *particles* of matter [not elements] into identic shapes." Therefore, says our Author—"It is impossible to say how far *a similar unity of effect may have been impressed on the forces through which vital organisms are* FIRST STARTED ON THEIR WAY."

In reply to the foregoing, it may be said, with great emphasis, that *crystals* "have nothing to do"—nothing whatever—with

"Vital Organisms"—not the *most remote* analogy between them. This, also, would have been appreciated by our Author had he understood Anatomy and Physiology. And, secondly, there is no analogy between the *compounded* particles of matter of which crystals are aggregated, and the *simple elements* of matter whose forces are supposed to have "first started Vital Organisms on their way." (See this question at p. 155–160.)

I now come more particularly to our Author's philosophy of the human Mind, which must also engage our attention, although the reader has, doubtless, formed his own conclusions as to its nature. But the work is one of the most important that has yet appeared in behalf of *universal materialism*, and embraces all the *best philosophy* of the subject. The ascription of Will and Intelligence to the material universe, and presenting it as a "Creator" or "Creative Power," is the culmination of the new doctrine of "Correlation or Equivalence of Forces." Its principal element, "no matter no force," is not only employed to abolish the Soul, but to make the material universe the only Creative Power. Moreover, I reiterate that, such are the analogies between the Divine and the human Mind, if the latter be the product of matter, so also, by an irresistible logic, must be the former. The application of the doctrines of the "Equivalence of Forces," and "No matter no Force," to the Soul, is a pretended scientific corroboration of the old notion of the self-existence of matter, and, therefore, addresses itself with greater pretensions to human credulity; and whoever respects his own reason, if not his faith, will not be led into the snare.

Our author, the Duke, prepares us for his coming demonstration against the SOUL in the following manner:

"Undoubtedly the *first thought* which suggests itself to the mind is, that *material Force and* a moral or *intellectual force* are essentially *different in kind*—not subject to conditions the same, or even *similar*. But are we sure of this? Are we sure that the FORCES which *we call material* are not, after all, but MANIFESTATIONS OF MENTAL ENERGY OR WILL? [!] We have already seen that such evidence as we have is all tending the other way. The conclusions forced upon us have been these: first, that the more we know of nature, the more certain it appears that a multitude of separate forces does not exist, but that

ALL HER FORCES PASS INTO EACH OTHER, AND ARE BUT MODIFICATIONS OF SOME ONE FORCE which is the source and the centre of the rest. Secondly, that ALL OF THEM are governed in their mutual relations by PRINCIPLES OF ARRANGEMENT WHICH ARE PURELY MENTAL. [!] Thirdly, that of the ultimate seat of force in any we know nothing directly. And, fourthly, that the nearest conception we can ever have of force is derived from our consciousness of vital power."

Such, then, is absolute *materialism* as it respects the Soul; and this induction from our Author's premises is too manifest for another word. But our Author does not altogether like the term, and endeavors to relieve it by a parallel between mental force and other modifications of force.

"Closer analysis of the phenomena of nature," he says, "and of our own ideas in regard to them, has already prepared us to believe that those forces which work in matter, and produce impressions from which we derive our conceptions of it, are themselves *immaterial*, and may be *traced up into a region where they are lost in the light of mind*"—or where they are transmuted into mental force, and which, therefore, is still immaterial.

That would be very good logic if it were granted that the Soul is only a modification of the forces of matter; but until that is shown we must pursue some other method to demonstrate its immateriality. The explanation is a mere evasion, a mere assumption that materialism consists in what it does not, to obtain the confidence of the Christian believer. It is of no moment whatever, whether the force which is supposed to give rise to the phenomena of Mind be material or immaterial, so long as the essential source of thought is assumed to consist of a modified force of matter.*

* Had the doctrine of the immateriality of force any bearing upon the question before us, it might be shown that it is disputed by writers of our Author's School, and shown by them to be unsupported by facts. Thus, Dr. METCALFE, in his work on *Caloric*, has the following common-sense remarks:

"It has been said, that 'the *material* theory contains an inherent vice, by assuming the existence of a body which has never been obtained in the separate form.' But if caloric do not exist in a separate state while passing through a *vacuum*, all our reasonings about it are fallacious and unintelligible. Nor is it possible to explain in a simple and satisfactory manner *any single one* of the phenomena ascribed to it by all parties, in accordance with the hypothesis that it is identical with MOTION, which is

It is in this acceptation that *materialism*, as applied to the Mind and mental processes, consists; not at all in a supposed materiality of force or of a Soul. If the latter be material, it is still as much a distinct entity and a self-acting Agent, and still as responsible, as if it were immaterial. Nor is it important to man whether it be one or the other; nor can its immateriality be demonstrated—only rendered in the highest degree probable, and this mostly so by the analogies which subsist between the Mind of man and the Divine Mind; for no one but the Materialist supposes that the Creator consists of matter and force, but that He is an Omnipotent Being who is perfectly distinct from the matter of which He is the Author. (See Chap. V.)

But what about the immortality of the Soul, which, in a personal sense, is a question of graver importance? Our Author gets at this, not by any reasoning, not by any "Law," but purely by an appeal to the Christian's faith in the *Resurrection* of the body. Matter is indispensable to force, and special conditions of matter, according to the doctrine of "Correlation or Equivalence of Forces," are necessary to the modifications of force and the variety of their manifestations, respectively. Hence it follows that our bodies must be raised from the dead as they now exist, if any human thought is to reappear after the grave. But according to "Correlation or Equivalence, or Metamorphosis and Conservation of Forces," force is indestructible, and therefore *immortal;* and when the body dies, the modified force which enabled the brain, &c., to display the manifestations of Mind, having lost its special substratum, passes into some other form of matter, where it appears in the aspect of heat, electricity, magnetism, gravitation, &c. But the resurrection of the body enables the force to reappear in its former modified condition of Mind. Here is our Author's argument:

"The Christian doctrine of the resurrection of the body involves the *notion* that there is some deep connection between

manifestly *not an agent*, but merely some body in the act of moving, and always implies the existence of a mover." "The advocates of the immaterial theory have never explained what causes bodies to vibrate; nor what keeps the particles of solids, liquids, and gases at a distance from each other while quiescent, or free from vibratory motion. And it is worthy of special notice that caloric is disengaged by pressure, friction, or percussion, only so long as bodies undergo condensation." (Other remarks upon it at Chap. VI.)

spirit and form which is essential, and which can not be finally sundered even in the divorce of death. The affections hold to this idea even more firmly than the intellect;"—and our Author brings to the support of this Tennyson's "passionate exclamation:"

> "Eternal form shall still divide
> The eternal soul from all beside,
> And I shall know him when we meet."

Here the "*immaterial force*" receives the designation of spirit while associated with the human brain. But what of that body which, in the Christian acceptation, is to undergo resurrection? Is it conformable to the requisites of "Correlation," &c., which demands the reappearance of our identical bodies for the manifestations of Mind? Not at all so; but something totally different, and therefore, according to our Author's doctrine, there can be no reappearance of the human Mind, but it must forever exist in some modified condition as different, as Mind, when associated with the body, differs from heat. For the "Christian doctrine of resurrection" declares that—"It is sown a *natural* body, it is raised a *spiritual* body. As is the *earthy*, such are they also that are *earthy;* and as is the *heavenly*, *such are they also that are heavenly.* Now this I say, brethren, that FLESH AND BLOOD CAN NOT INHERIT THE KINGDOM OF HEAVEN."—And our Lord affirms that "SPIRITS HAVE NO FLESH AND BONES." Now what a contrast of things is that—a body without flesh, or blood, or bones for the materialistic doctrines of "Matter and Force," and the "Correlation, Equivalence, or Metamorphosis of Forces."!!

But the incautious Duke, in endeavoring to protect himself against the damaging imputation of materialism, convicts himself of the exact doctrine. The following is his creed, in his own "exact import of words." Thus—

"But here, again, let us beware of the *fallacies* which may arise from a failure to recognize the EXACT IMPORT of the words we use. In the ears of many *it sounds like* MATERIALISM to say that THOUGHT IS A FUNCTION OF THE BRAIN. But it has been already shown in a previous chapter that FUNCTION is merely the word by which we describe *that work to which any given piece of mechanism has been adjusted.* THE POWER OR FORCE WHICH IS DEVELOPED *through means of an organ is not identical with that or-*

gan, nor with any of its parts, nor with the materials of which it is composed, nor even with its mechanism as a whole. *It does not follow, for example, that* ELECTRICITY IS IDENTICAL WITH THE TISSUES OF A FISH, BECAUSE IT IS DEVELOPED *out of the battery of a Torpedo or a Gymnotus. Yet it is true that the* DEVELOPMENT AND DISCHARGE OF ELECTRICITY IS THE FUNCTION *of those fish organs*—that is to say, THIS IS THE WORK WHICH THEY HAVE BEEN ADJUSTED TO PERFORM."

Such, then, is a very accurate description of an *organic* function; and it is also a very exact description of the *secretory doctrine* of Materialism. Indeed, it is unsurpassed—so that I have placed the most precise parts of it in capitals. It affirms that the *production of Thought is the function of the brain*, just as the production of electricity is the function of the battery of a torpedo or a gymnotus, or as the production of bile is the function of the liver. It is exactly the materialistic doctrine of the *secretion* of Mind in its comprehensive sense. It places the elimination of the materialistic mental force on the same ground precisely as that of any physical product of the body, and renders the brain *the only source* of Thought; which is excited to the performance of the function, like the battery of the torpedo, the liver, &c., by the blood or other remote physical agents. But our Author would never have placed this upon record but from his mistaken notion, as we have before seen, that *materialism* consists in affirming the *materiality* of the secreted or developed force, and which led him to premise that heat, electricity, &c., are "immaterial" (Chap. V.).

In the foregoing opinion Professor OWEN, in his work on the "*Anatomy of the Vertebrates*" (1868, vol. iii.), agrees *verbatim*. Thus—"*Thought* relates to the brain of man *as does* Electricity to the nervous battery of the Torpedo; both are *forms of force*, and *the results of action of their respective organs?*" "A general physiological conclusion from the phenomena of the nervous system inevitably brings on a collision with a *dogmatic affirmation or definition* of the cause of the highest class of those phenomena *instilled* as an article of religious faith into fellow-Christians, and on which is based *their mode of thought* affecting dearest hopes and highest aspirations. It must be repugnant to any good man's feelings to say aught that may unsettle such mode of thought."

Then why attempt to "unsettle such mode of thought" without offering a better substitute than the "Conservation" of that physical force which is assumed to have been "correlated into Mental Force" by the organic condition of the brain? The eminent Author goes on immediately to dispose of the Soul by objecting to its analogy even to a musician's fiddlestick. Thus—

"If the hypothesis that an *abstract entity* produces psychological phenomena *by playing upon the brain* as a musician upon his instrument, producing bad music when the fibres or cords are out of tune, be rejected, and those phenomena be held to be *the result of cerebral actions*, an objection is made that the latter view is '*materialistic*,' and adverse to *the notion* of an independent, indivisible, immaterial, mental principle or Soul." No disavowal of the Soul, and affirmation of materialism, can be more explicit. And again—"In the endeavor to *clearly* comprehend and explain the functions of the combination of forces called brain, the Physiologist is hindered and troubled by the views of the nature of those cerebral forces which *the needs of dogmatic theology have imposed upon mankind*." ! !

A doctrine very similar to the foregoing was taught by EPICURUS (342 B.C.). It is said that—

"He conceived the Soul to be a fine, elastic, sublimated, spiritualized gas, or aura, composed of the most subtle parts of the atmosphere, as *caloric*, pure air, and vapor, introduced into the system in the act of respiration, *peculiarly elaborated by peculiar organs*, and united with a something still lighter, still rarer, and more active than all the rest; at that time *destitute of name*, and incapable of sensible detection, offering a *wonderful resemblance to the electricity* of modern times. In the words of Lucretius, who has so accurately and elegantly described the whole Epicurean system, thus translated—

> "'Far from all vision this profoundly lurks,
> Through the whole system's utmost depth diffused,
> And lives as soul of e'en the soul itself.'

"'The Soul thus produced,' Epicurus affirmed, 'must be material, because we trace it issuing from a material source; because it exists, and exists *alone in a material system;* is nourished by material food; grows with the growth of the body; becomes ma-

tured with its maturity; declines with its decay; and *hence*, whether belonging to man or brutes, *must die with its death.*'"

From the doctrine just quoted from our Author, the Duke, unavoidably results his fundamental law in respect to Mind, that "*Mind is as much subject to Law as the body is.*"—"Forces which are in essence, and *their source* utterly mysterious, are always being found to operate under rules which have strict reference to measures of number—to relations of space and time." And this is the key to his denial of freedom of Will and to the distinction which he makes between the Will of Man and animals. But we are now interested about the Mind of man, who has very little Instinct, but Reason instead. Let us here extend the former part of our last quotation.

"The Mind is as much subject to Law as the body is. The Reign of Law is over all; and if its dominion be really incompatible with the agency of *volition*, human and *Divine*, then the *mind is as inaccessible to that agency as material things.*"

The syllogism is its own interpreter. The premises are distinct, and the conclusion unavoidable. Here we might rest this discussion with our Author, were it simply an object to present a fair analysis of his work as it respects our subject. But the opportunity of exhibiting the best exposition and defense of materialism that has yet been attempted is too important to allow us to neglect any advantage which its advocates may claim, or which may be converted to our own purposes. I, therefore, pass on to another parallel illustration of the purely physical origin of Thought. Thus—

"The *muscular contractions* of the body stand at the very *fount and origin of all we do;* and it is more than probable that *analogous movements of the brain* stand as near the ORIGIN *of all we* think."

Here, then, in the first place, the only ground of reasoning from "muscular contractions" to "analogous movements of the brain" must consist alone in the fact that *the analogy exists*, and in the *relationship* of the phenomena of muscular contractions and of the processes of Reason; and surely I need not say that there is none whatever in either respect. It, therefore, fails entirely of placing the brain on common ground, or in any functional relationship with the muscles, and equally, also, of placing

the results of "muscular contractions" and of "analogous movements of the brain" in any corresponding aspect. Nor has it been in the least demonstrated that acts of the Mind are attended by movements of the brain—not even of its component molecules. Its mode of participation in the production of mental phenomena is totally unknown. The conclusion has been entirely predicated of the results of physical influences upon other parts of the body. Secondly—Moreover, so far is it from the other aspect of the supposed analogy, that "the muscular contractions stand at the very fount and origin of all we do," it is the brain, or rather the Mind, that is "the fount and origin of all we do"—the very contractions of the muscles having their origin in that organ which supplies the exciting nervous influence. These expedients of Materialism, so at war with facts, and so readily accepted by those unacquainted with anatomy and the laws and functions of the nervous system, demand an unreserved, so only a fair, exposure.

It is also a great mistake of our Author to suppose that diseases of the brain, in their influences upon the Mind, go to the proof of his doctrine. It simply shows that the brain, in being the organ of the Soul for the purpose especially of associating the spiritual part with the organs of sense and the voluntary muscles—it shows that the integrity of the brain, as might be inferred, *a priori*, is essential to an unembarrassed operation of the Mind. Hence the following statement has no significance, as bearing upon materialism, but is an abstract fact without any reference to the phenomena that declare an associate self-acting Principle which, for example, manifestly calls the brain into operation in all acts of the Will in voluntary motion. Thus our Author—

"When the bursting of a *small duct of blood* upon the brain is seen to *destroy in a moment the mind of man, and to break down all the powers of his intellect and will*, we are in presence of a fact whose SIGNIFICANCE can not be increased by a million of other facts analogous in kind."

"*Small* duct of blood" is good for *materialism*, but is as bad for the *brain* as "the bursting" of a larger one. The blood will equally accumulate from the smaller as the larger vessel, and break up the brain as effectually as a blow of a hammer. Such

is the condition of the brain in our Author's hypothetical case. But look at a contrast. A paroxysm of Anger and of Joy has not only "destroyed *in a moment* the Mind of man, and broken down all the powers of his Intellect and Will," but it has at *the same moment* killed the entire life of the body without leaving *a trace of any injury of the brain.* "Are we not here in the presence of a fact" which routs the enemy? If the effusion of blood and laceration of the brain kills in our Author's case, there must be SOMETHING that does the mischief in the other; and if it can be intelligibly shown that any thing but a Substantive, Self-acting Agent is the efficient cause, by inflicting a violent shock upon the brain—a sort of suicidal act—then Materialism may defy all comers. Our Author must try again; and in doing this he will probably point to the so-called "forces" which led to the paroxysm of Anger or Joy—perhaps a fancied insult, or a sudden acquisition of wealth. That is the only retreat; but it leaves the subject just where it was left. In either case, the remote cause which rouses the Mind exerts its primary effect upon the Mind. Or, suppose that the paroxysm of anger is excited by offensive words or demeanor. An impression, in this case, is made upon the brain through the medium of the senses, of which the Mind takes cognizance—and that is *Sensation* (p. 29). The Mind, then, elaborates the Sensation according to the meaning of the words spoken and the attitude of the offender, and it may submit passively, or it may let loose a tornado of passion; and this may depend upon whether there was a provoking display of an open palm or a special expression of the facial muscles. But even at the worst a good-natured man may exercise a Christian forbearance, and "offer the other cheek also." No harm is done by the insulting words, &c., in the one case, but death in the other. But if the words and offensive demeanor (or either alone) of the assailant kill, in the latter case, by their action on the brain, according to the Materialist, then, surely, they should have the same effect when the assaulted suppresses his passion, but when no harm ensues. Hence it is obvious that, whatever remote causes may be concerned by their action upon the brain in bringing the Mind into violent operation, they have nothing to do with any injury inflicted upon the organ. That is altogether due to the immediate Mental Cause. Or, take the case of sudden death

from a paroxysm of Joy, where nothing but the most agreeable Emotion is set in operation; as, when a pauper hears of an unexpected inheritance of a million. Surely, such in themselves are no killing words, whether they come through the ear or the visual organ.

And thus the parallel runs throughout with our Author's example of the "small duct of blood." Some remote cause has been the occasion of the rupture of the duct, but has had no action upon the brain. The injury of the organ has been wholly inflicted by the effused blood. The cases are thus far entirely parallel. But in the one case the agent is purely *passive*, while in the other it is purely *self-acting*. The Mind may resist the influence of the remote cause, and save the brain from its destructive effect; or it may kindle itself into a tempest of Anger, or a paroxysm of Joy, and thus impart a shock to the brain which kills, not only the life of the organ, but, through that destructive effect upon the brain, the life of the whole organic fabric. Whoever has a Mind disposed to look impartially at the facts will necessarily regard the effused blood or the blow of a hammer and the action of the Mind, in the several cases, as equally the immediate, efficient cause of the death of the brain and body.

It may be useful to the reader uninformed in Physiology to correct another important error which our Author inculcates with an air of plausibility. It occurs in the following sentence:

"No series of facts tending to the establishment of any physical truth is *more complete or more conclusive* than the chain which connects the *functions* of the brain with the *phenomena of mind*."

Now the illustration just before quoted of the "bursting of some small duct of blood" comprehends about the whole "chain of facts" that "connect the functions of the brain with the phenomena of mind," and "can not be increased by a million of other facts of an analogous nature." The subserviency of the brain as it relates obscurely to the phenomena of Mind is not doubted by the Spiritualist. But such is not what is understood by the *functions* of that organ, which refer to the actions of all other parts, and to its own condition as an organ. The real *fact* is, therefore, there is no connection whatever between the functions of the brain, properly so called, and the phenomena of

Mind, excepting as the functions of the organ are necessary to its own natural condition and the relations which they bear to the functions of other organs. In sleep all the phenomena of Mind are completely suspended, and yet the functions of the brain go on as perfectly as in the midst of the deepest thought, and without the slightest apparent modification; nor can any analogy whatever be derived from other organs to illustrate the subserviency of the brain to the processes of Mind. But whatever *it* be, the Soul and Instinctive Principle make the initiatory movement as *originating self-acting Agents;* though, when Sensation operates, the Mind is called into action by some inappreciable impression upon the brain, when the Mind, through an equally inappreciable concurrence of the organ, takes cognizance of the impression. But I have gone extensively over this ground in my direct demonstration of the Soul and Instinctive Principle.

In connection with a former quotation relative to the secretion of Mind (p. 254), our Author remarks that—"We have no knowledge of what the forces are which demand obedience, and which call for this contrivance," the brain. Certainly, no other force in nature than a *self-acting* one can be possibly surmised as rendering the brain tributary to mental processes. Grant this self-acting Agent, and the whole mystery disappears. There will then be no occasion for surmising the "development of a force as the function of the brain" upon which Thought depends (p. 254). The absolute analogies of the human Mind to the Divine Mind will then remove any doubt that such an Agent performs all the essential work, and enable us to understand that, in being associated with the brain to connect us with the world of matter through the senses and voluntary muscles, that organ is in all consistency rendered tributary to all the operations of the Agent. We have seen that it is a common pretense that we know nothing of the *nature* of physical forces, and therefore nothing of the nature of mind; and the same is equally alleged of the "Unknowable." This is very true; but it is alike true of matter. It is, however, in no respect our question—only delusive sophistry; and I would keep before the reader the facts that we know the existence of each by their phenomena or manifestations, and by those alone—that from these we reason to the laws which the forces of matter obey, and that this is the only knowl-

edge that is useful to man—that of their *nature* of no use whatever.

Our Author has much to say upon the freedom of the human Will, which he places under the influence of Law, and identifies it, in principle, with the Will of animals. The distinction which he makes consists in the greater variety of influences which operate in giving direction to the Will of man. Our Author thus—

"*Free will*, in the only sense in which this expression is intelligible, has been erroneously represented as the peculiar prerogative of man. But the Will of the lower animals is as free as ours. A man is not more free to go to the right hand or to the left than the eagle, or the wren, or the mole, or the bat. The only difference is that the Will of the lower animals is acted upon by fewer and simpler motives, and the lower the organization of the animal the fewer and simpler these motives are." "The conduct of animals is less capable of being predicted in proportion as it is difficult or impossible to foresee the nature and number of the motive forces which are brought to bear upon the Will. Man's Will is *free* in *the same sense*, and in the *same sense only*. It is subject to *Law in the same sense, and in the same sense alone*. That is to say, it is subject to the influence of motives, and it can only choose among those which are presented to it, or which it has been given *the power of presenting to itself*."

This consistency necessarily grows out of our Author's doctrine of the secretion of *Mind* (p. 254). It is that which leads him to place the Instinct of animals and the Mind of man so equally under the Reign of Law, that he loses sight of the fact that man is endowed with Reason, properly so called, by which the Soul is especially distinguished from the Instinctive Principle. Man, indeed, has very little Instinct; and it is Reason, therefore, in man which gives determination to his Will; although the latter is so strongly pronounced that it appears to exercise a commanding influence over the Rational Faculties, however much these Faculties may be instrumental in bringing the Will into operation (p. 57). In animals the operation of the Will is considerably a matter of law, for, as will be seen (Chapter XVI.), animal Instinct is ordained for the well-being of organic life, and has no higher aim. But this distinction is, of course,

not recognized in materialism. Our Author, however, occasionally makes a distinction between the mental capabilities of man and animals as it respects the influence of *motives;* and it is the relative ability of one or the other to choose among them—which, nevertheless, is determined by Law.

"In this last power," our Author goes on, "we touch the secret of that boundless difference which separates man from the highest of the animals below him." "He is exposed, indeed, to the lower motives in common with the beasts. But there are others which operate largely upon him, which never can and never do operate upon them." "It is true that our Wills can never be free from motives, and in this sense we can never be free from Law." "It is from COMPULSION that our Wills are FREE, and from NOTHING ELSE." But mark—"To our Will," he says, "*has been given the power of presenting motives to itself.*"

In describing the special motive influences which operate upon man's Will as distinguished from that of animals, he refers them to sources which, collectively, make up the endowments of Reason. But our various quotations bearing upon the subject enable us to understand the true import of the terms as employed by our Author, and the whole drift of the discussion. The terms are necessarily employed in conformity with common usage, and are made to stand for the phenomena to which common usage has assigned them. Our Author, for example, sometimes employs the word reason, as he does will, reflection, conscience, &c., to render himself intelligible; but our various quotations determine the sense in which they are employed. Our Author's meaning must be ascertained by the essential and demonstrative parts of his work, not by incidental remarks made in compliance with the law of language. Our Author, indeed, fully appreciates the importance of the right use of words, having had a troublesome experience with others who had employed them in an ambiguous sense; which leads him to say that—

"There is no fault in philosophical discussion more pestilent than that of using common words in some technical or artificial sense, without any warning to the reader (often apparently without any consciousness on the part of the writer) that the ideas fundamentally involved in the use of the word are eliminated and set aside."

In only one respect has our Author departed from the foregoing precept, and that one is of transcendent importance. In his use of words relative to the Mind and Creation, he sometimes employs such as are of established significance, as, for example, Design, and Will, and Intelligence, in connection with Creation, while that established import is "eliminated and set aside" by restricting the Mind to the mechanism and functions of the brain, and assigning the Creation of organic beings to the forces of inorganic nature acting under a "Creative Law." In the last paragraph of his work, where he is treating of "Law in Politics," he has an apparently saving clause which, *abstractedly*, is quite of an orthodox nature, both as to a Creator and freedom of Will. Thus—

"Our freedom is a reality, and not a name. Our faculties have, in truth, the relations which they seem to have to the economy of nature. Their action is a real and substantial action on the constitution and cause of things. The *laws of nature* were not appointed by the great Lawgiver to baffle His creatures in the sphere of conduct, still less to confound them in the region of belief. As *parts* of an order of things too vast to be more than partly understood, they present, indeed, *some difficulties which perplex the intellect*, and a few, also, it can not be denied, *which wring the heart.*"

That is well enough abstractedly, although cautiously, if not obscurely said. But what a conflict is here between "the great Lawgiver and His creatures," and all that we have seen in our various quotations which declare the origin of living beings in inanimate matter through its inherent forces acting under "CREATIVE LAW."!! As a summary of the whole, I repeat the following:

"If I am asked," says our Author, "whether *I believe* that every species has been a separate creation—not born, but *separately made*—I must answer that *I do not believe it.* I think the facts do suggest to the mind the idea of the WORKING OF SOME CREATIVE LAW, almost *as certainly* as they convince us that we know nothing of its nature, or of the *conditions* under which *it does its glorious work.*"

That is a clear, explicit declaration of our Author's "belief," and everywhere sustained by his demonstration of the "Reign of Law" and of "Creation by Law." It is the whole tendency

of our Author's work. It will not answer to assume that the laws of nature were ordained and *rendered creative* by a "Lawgiver," for that would be a mere subterfuge to reconcile the Theist to the Pantheistic doctrine. It would be also equally a fatal blow at the foundation of all Religion; and in this sentiment there can be no doubt of the full concurrence of the religious world, and of no small part of the heathen—to say nothing of the monstrous absurdities of the doctrine, as I have already undeniably shown. Neither the *Acarus Crossii* nor its relative principles have been admitted into any religious creed, notwithstanding the importunities of "Modern Science." Our Author follows in the wake of the celebrated "*Vestiges of the Natural History of Creation.*" (See p. 180.)

But let us dispose, in the most summary manner, of any illusion that may attend the phraseology—"Creation by Law" or "Creative Law," and which will not be controverted by the advocates of "Law." *Law* is ingrafted upon the institutions of nature, and has nothing to do with the Creative Acts of a Personal God; for the interposition of His Creative Power transcends all law, and is a total abnegation of its operation. "Creation by Law," therefore, necessarily refers the origin of living beings to the forces of inorganic nature, operating upon inorganic materials, and is totally exclusive of Divine agency. Whence it results that, in assigning to *Law* what is strictly the work of Creative Power, the doctrine is necessarily atheistical.

Lamarck, another of our Author's Antitypes, after meeting with "some difficulties which perplex the intellect," and which the Laws of Nature were supposed not fully to explain, shifts the responsibility upon a "Lawgiver." But Sir CHARLES LYELL shall tell us how; and the reader will observe that it is essentially not only our Author's doctrine, but of the "Vestiges of the Natural History of Creation," and very nearly that of Darwin. I shall quote Lamarck's speculations upon the difficulties which attended his original hypothesis, that it may be seen that its modification is virtually the Darwinian theory of development, but admits a creative law of low forms of organic beings; that it consists of the grossest assumptions, and that the difficulties alone are quite a convincing proof that organic beings were never the creatures of any Law of Nature:

"The reader will immediately perceive," says Sir Charles Lyell, in referring to Lamarck, "that when all the higher orders of plants and animals were thus supposed to be comparatively modern, and to have been derived, in a long series of generations, from those of more simple conformation, *some farther hypothesis became indispensable*, in order to explain why, after an indefinite lapse of ages, there were *still so many* beings of the simplest structure. Why, moreover, has the *process of development* acted with such unequal and irregular force on those classes of beings which have been greatly perfected, so that there are *wide chasms in the series*—gaps so numerous, that Lamarck fairly admits we can *never expect to fill them up* by future discoveries." "The following hypothesis was, therefore, provided to meet these objections. Nature is OBLIGED to proceed gradually in all her operations; *she can not produce animals and plants of all classes at once*, but must always *begin* by the formation of the *most simple* kinds, and *out of them* elaborate the more compound, *adding to them*, successively, different systems of organs, and *multiplying more and more* their number and energy. This nature is *daily engaged* in the formation of the *elementary* rudiments of animal and vegetable existence, which correspond to what the ancients termed SPONTANEOUS GENERATION. She is always beginning *anew*, *day by day*, the work of creation, by forming monads, or 'rough draughts,' which are the only living things she gives birth to *directly*." "After a countless succession of generations, a small *gelatinous body is transformed into an oak or an ape; passing on at once* to the last grand step in the progressive scheme, by which the orang-outang, having been already *evolved out of a monad*, is made *slowly* to attain the attributes and dignity of man." "By virtue of the *tendency* of things to *progressive improvement*, the *irrational was developed into the rational*."

Such are the principal features of Lamarckism; and, before presenting the following summary comment by Sir Charles, it may be well to say that it was made before he embraced Darwin's hypothesis of development; although, as we shall see, Sir Charles, at this very time, was verging closely upon it. But, as will appear in our thirteenth chapter, he has been an earnest advocate of the origin of living beings in the forces and laws of inorganic nature, and of their progressive formation in conformity

with the "law of extinction." He preferred the assumption of an abrupt and full development of species out of inorganic materials to the organic mutations of Lamarck's hypothesis. He is, therefore, led to the following comment upon the rival doctrine:

"In conclusion," says Sir Charles, "it may be proper to observe that the above sketch of the Lamarckian theory is no *exaggerated picture*, and those passages which have probably excited *the greatest surprise* in the mind of the reader are *literal translations* from the original."—*Principles of Geology.*

In support of the violation of physical impossibilities, as shown in our seventh chapter, and of the Creative Law of the forces of inorganic nature, we have a few words from Sir CHARLES LYELL, at the close of his work on the "*Geological Evidences* of the *Antiquity of Man*" (1863). As his strongest argument, he quotes the opinion of Dr. ASA GRAY, an eminent American Botanist, from his work on "*Natural Selection* not *inconsistent with Natural Theology*," that—

"We may imagine that events and operations in general go on in virtue simply of forces communicated at the first, and without any subsequent interference, or we *may hold* that *now and then*, and *only* now and then, there is a direct interposition of the Deity; or, lastly, we *may suppose* that all the changes are carried on by the immediate, orderly, and constant, however infinitely diversified, action of the *intelligent* efficient *Cause*."

To which Sir Charles adds that—"They who maintain that the origin of an individual, as well as the origin of a species or a genus, can be explained only by the *direct* action of the creative cause, may retain their *favorite theory compatibly* with the DOCTRINE OF TRANSMUTATION."!!

Creation is a deceptive term as applied to the forces of inorganic nature. Its meaning is defined by the Creation of matter and its forces by a direct act of the Deity. The Creation of matter by a direct act settles the meaning of the term. When employed to represent a delegated power, it is without the shadow of an authority, and a delusive expedient to sustain the pantheistic doctrine.

It will be now interesting to observe how the foregoing subject was managed by the learned two centuries ago. The celebrated Rev. Dr. HENRY MORE, of Christ's College, Cambridge,

shall be our authority. In his work on the "*Immortality of the Soul*" (1659), he ascribes the origin of animals and plants to the laws of Nature; and here we meet with the terms, now in use, "*Spirit of Nature*," "*Soul of the World*," and "*Plastic Power*," and even with the term "*Quartermaster-general*," which he applies indiscriminately to the creative power. The power is thus defined by More:

"The Spirit of Nature is a Substance incorporeal, but without sense and animadversion, pervading the whole matter of the universe, exercising a plastic power therein, according to the sundry predispositions and occasions in the parts it works upon; raising such phenomena in the world by directing the parts of matter and their motions, as can not be resolved into mere mechanical powers."

It is a common hypothesis that the Creative Law operated in the production of species of animals and plants under the special influences of certain localities, or, as they are called, "centres or foci of creation;" particularly as they are found in isolated places. With the plants there is no difficulty, since the reasonable presumption is that they were simultaneously created in conformity with the climates which they inhabit. The same would be true of animals, the only difference relating to the dispersion of the land animals after the Flood. But who shall say that immediately subsequent to the Flood there were not connections with the Asiatic continent that admitted an unlimited dispersion of animals, and that they instinctively settled themselves in regions most congenial to their nature? (See Appendix II.)

The opinion, however, in Theoretical Geology, expounds the problem by referring it to the special influences of climate upon the "organic law of creation." It is thus expressed by Sir CHARLES LYELL in his Geology:

"We know nothing of the details of the various classes of the animal kingdom which may have inhabited the land when the secondary strata were accumulated; and in regard to some of the more modern tertiary periods, the *climate* of Europe does not appear to have been of such *a tropical character* as may have been *necessary for the* DEVELOPMENT of the tribe of apes, monkeys, and allied genera."

The following is also worth quoting in connection with the

"foci of creation," on account of its associations; while it shows us how general is the dependence upon "Creative Law," or, as it is here called, "Organic Law of Creation," and is a good exemplification of the cautious method observed by many of avowing spontaneity of living beings. It comes from the distinguished Dr. MANTELL, who is said, in the journal of the London Geological Society for August, 1848, to have applied his collection of bones from New Zealand towards an illustration of "THAT DIFFICULT PROBLEM, THE MYSTERY OF MYSTERIES, as it has been emphatically termed by Sir John Herschel, the appearance and extinction of certain types of organic beings on the surface of the globe." Then follows Dr. Mantell's solution of the problem as suggested by the New Zealand bones. Thus—"In this point of view, the *Age of Reptiles* may be considered as merely an *exaggerated* effort of the *Organic Law of Creation*, which is imparted to the fauna of the Galapagos Islands in a reptilian character."

All this, too, is sometimes accompanied by a prodigal display of faith in that very Revelation which it wounds in its most vital parts, and with the more dangerous pretensions that it harmonizes with the Word of God.

Various estimates have been made by Geologists of the number of foci or central parts of the globe in which animals have been developed under the "Organic Law." Swainson supposes five; Pritchard, seven; others eleven. Of botanical regions De Candolle estimates twenty-seven, and Professor Henzlow forty-five, against the Mosaic *one*.

The Duke of Argyll has contributed an important work to the cause he maintains, and it has met with distinguished favor. It has therefore called for a careful analysis. If it has failed in its object, so must all others of similar pretensions. I have endeavored to show that its whole tendency is to instill the belief that there is no Personal Creator and no Soul; and it is the adroitness with which it is executed, and the fallacies which underlie it, and a desire that our Author should speak fully for himself, and also his eminence and influence, which I offer in justification of the extended notice bestowed upon his work. I may say, also, that the Mosaic Narrative of Creation may be regarded as a fiction without in the least affecting the question of an original

Creation of all things, and of the animal kingdom in a state of maturity, by a Personal Creator. The narrative is a distinct subject; though, if its general doctrine of the Creation of man and animals by a Personal Deity be rejected, and their origin be referred to the "working of some Creative Law," then must also be rejected the concurring testimony of the Prophets, and of our Lord and his Apostles, and Christianity must become an illusion. All this, too, loses its interest to man if there be no other source of mental phenomena than what Materialism ascribes to the working of the brain—either a chemico-molecular action, or a secretory process, or a combustion of phosphorus. The Narrative of Creation has, thus far, had no direct part in my discussion of the questions before us. I have argued them upon Nature's own premises, and the admitted facts and fundamental principles of Science. I have shown by demonstrations which no Wit can invalidate that animals were not only the immediate work of an Omnipotent Being, but that He created them in a state of maturity both of mind and body. There can be, I say, no appeal from that demonstration; and whoever adopts the developmental scheme in any of its phases is necessarily involved in Atheism, or Pantheism, or Spinozism; between which, however, there is no distinction, excepting as the last two represent Atheism in disguise.

If our Author, the Duke, however, can show that my interpretations of his language are not correct (should he have any disposition to do so), I am sure that in thus modifying its obvious import he will render a service to all who may be disposed to accept his doctrines as evidently inculcated.

I have said that our Author occasionally appeals to the Holy Scriptures in support of his doctrines, and I have shown the manner in which it is done. He even calls to his aid certain passages relative to the mission of Christ for the salvation of man; and then affirms that—

"Whatever more there may be in such passages, they all imply the UNIVERSAL REIGN OF LAW in the MORAL and SPIRITUAL *as well as in* the MATERIAL *world;* that those laws had to be—behooved to be—obeyed; and that the results are brought about by the adaptations of means to an end, or, as it were, by way of *natural* consequence from the instrumentality employed. *This,*

however, is an idea which systematic theology regards with intense suspicion."

And well may it be so regarded; for here Christianity is merged in the Laws of nature, and, were there no "intense suspicion," "UNIVERSAL REIGN OF LAW" would march off in triumph, and Christianity lie prostrate before the destroyer! All is on common ground—Spirit and matter—matter and Mind—all under common laws—taking Christianity in the general sweep, without regard to the mode of our Lord's Incarnation; His own miracles; the blood that was shed, as had been prophesied; His Resurrection from the dead, as attested by the subsequent devotion of all the Disciples who had abandoned Him upon the Cross, &c.; for, in immediate connection with the foregoing, our Author insists that—

"We are perpetually reminded that the *Laws of the* SPIRITUAL WORLD are in the highest sense LAWS OF NATURE, whose obligation, operation, and effect are all in the *constitution* and course of things."

Our Author is here very consistent with his fundamental philosophy; and the foregoing would be a legitimate induction from the materialistic premises that Mind is either secreted by the brain, according to our Author (p. 253), or the mere result of its chemical or molecular action. But it would not justify a suppression of the direct statements bearing upon these topics when appealing to an AUTHORITY which inculcates doctrines of an opposite nature. Nor may we neglect, in this connection, our Author's doctrine that—"It is impossible to describe or explain the facts we meet with in any branch of science without investing the Laws of Nature with something of that personality which they do actually reflect, or of conceiving of them as partaking of those attributes of mind which we everywhere recognize in their working and results." But, however cautiously the adverse statements of Revelation may be suppressed, it is the policy of most writers who would instill the doctrines of materialism and pantheism to approach our faith in Spiritual things with great circumspection of language, and often, indeed, to affect an affiliation with that faith which they are employed in undermining; and even to so far simulate the believer's creed as to contradict themselves. This, however, is mostly in respect to Crea-

tion, while Materialism as to the Soul is less cautiously inculcated. But in the former case a certain deference to "systematic Theology" is known to be indispensable to success, and that a *circumlocution*, pointing to Creative Power, is the only expedient by which the doctrine of the origin of living beings in the forces of inorganic nature can be successfully instilled, or even insinuated. Nay, more; so thoroughly demonstrated are the useful effects of the Bible and of the Christian Religion upon the masses of mankind, that Atheism is constrained to admit their unqualified beneficence, and to consent to them as a basis of moral instruction in the popular systems of education.

Finally, our Author, the Duke, has an extended disquisition upon the Reign of Law in Politics, but which has no relation to the questions before us. I may say, however, that the improvements in the arts, sciences, legislation, &c., which he subjects to the control of Law, are nothing more than exemplifications of human Reason availing itself of progressive discoveries and improvements for still farther advances. And however long they may be in a dormant state, it is simply owing, either to the accidental want of mental ability to convert them to still higher attainments, or to their neglect, or, as they may be brought into light by some still more accidental, or, perhaps, very trivial causes, as in the *fall of an apple* leading to the discovery of Gravitation, or the *kite* to the identification of Lightning and Electricity, and thence to Morse's Telegraph and Field's Atlantic Cable. We build mostly, however, upon the past. The law of human progress has been exemplified throughout the historical ages. When knowledge is lost by one nation it is perpetuated by others, however liable to stagnation, or perverted to the propagation of error.

It will now be interesting to compare the materialistic doctrines already noticed, and such as remain to be considered, with those which were inculcated by SPINOZA two hundred years ago, known as *Spinozism;* particularly as he is said to be the first who reduced Atheism into a system, and formed it into a regular body of doctrines, ordered and connected according to the manner of Geometricians. For this purpose we will consult the impartial work entitled "*A Biographical Dictionary*, containing an Historical and Critical Account of the Lives and Writings of the Most

Eminent Persons," &c. (12 vols., 2d edition; London, 1784). But we will first look at some preliminary statements:

"Upon the whole, we see," says his Biographer, "that Spinoza was a Jew by birth, a Christian through policy, and an Atheist by principle." "As to his Atheism, it is not, perhaps, so clear and evident as not to admit of disputation till after his death, when his *Opera Posthuma* put the thing out of doubt. For, although his *Tractatus Theologico-Politicus*, printed at Amsterdam in 1670, contains all the *seeds* of that Atheism which was afterwards displayed in his *Opera Posthuma*, some writers have shown clearly enough that Atheism was fairly deducible from the principles laid down in the *Tractatus Theologico-Politicus*. Such strange, absurd, and contradictory combinations of ideas are frequently found to exist in the head of the same man. His *Opera Posthuma*, however, as we have observed, put the thing out of doubt.

"His hypothesis was that—'There is but one substance in nature, and that this only substance is endowed with *infinite attributes*, and, among others, with extension and *Thought*.' Afterwards he affirms that all bodies in the universe are modifications of that substance, as it is extended; and that, for instance, the *souls* of men are *modifications* of that substance, as it thinks; so that God, the necessary and most perfect Being, is the cause of all things that exist, *but does not differ from them*. He affirms that there is but one Being and one nature; and that this Being produces in itself, and by an immanent action, whatever goes by the name of creatures; that he is at once both *agent and patient*, *efficient cause and subject*, and produces nothing but what is his own modification." "The doctrine of the *soul of the world*, which was so common among the ancients, and made the principal part of the system of the Stoics, is, at the bottom, the same with that of Spinoza. The first and fundamental principle of the two systems is manifestly the same; and perhaps the difference, if there be any, would be found to consist chiefly in the different manner of explaining it."

The materialistic doctrines which we have been considering—Materialism in its relation to Mind—the origin of living beings in the forces of inorganic nature, and other kindred developmental hypotheses—and their inevitable consequence, Pantheism—have received an immense reinforcement, and no little plau-

sibility, from Theoretical Geology. But the questions between us and Geology, and all the doctrines which bestow upon inorganic nature the Attributes of the Creator and such also as distinguish the Soul of man, have been, and will continue to be, argued upon scientific, not upon Scriptural ground—not even the proof which will be ultimately presented in behalf of the literal interpretation of the Narratives of Creation and the Flood. Our questions must be referred to facts, not to that Revelation which is rejected, excepting as it is sustained by facts and by its own internal proof. Nor do the questions relate to the consciences of men, nor how they may estimate the good or the evil of the doctrines. We do but offer our criticisms and judgment upon them. In our opinion they not only assail Revelation, but are at war with the facts and established laws of Science. These we defend, and the World is the Arbiter.

CHAPTER IX.

MATERIALISM, PANTHEISM, ATHEISM, PURSUED UNDER VARIOUS OTHER PHASES. — OPINIONS OF CHRISTIAN AND HEATHEN PHILOSOPHERS.

"A Bowman took aim at an Eagle, and hit him in the heart. As the Eagle turned his head in the agonies of death, he saw that the Arrow was winged with his own feathers. 'How much sharper,' said he, 'are the wounds made by weapons which we ourselves have supplied!'"—Æsop.

Listen to the alarm which is sounded by one who has been long standing upon the watch-tower, and who is eminently qualified by his genius, his intercourse with the world, and his devotion to the interests of humanity, to tell us of his large experience, and to offer words of admonition. Thus, then, Giuseppe Mazzini, in a letter to Edgar Quinet, as published in the New York Daily Tribune of May 2, 1870:

"This Generation has opinions, but no faith. It denies the existence of God, of Immortality, of Love, of Eternal Promise, the future of those who love, the belief in Providential law, all that is beautiful, good, and holy in the world—a whole heroic trinity of religious feeling, from Prometheus to Christ, from Socrates to Kepler—but grovels on its knees before Comte and Büchner. This Generation studies passing Phenomena, but ignores the Causes that produce them. It admits Law, but ignores the Lawgiver—*the form without the substance—the means without the end.*"

It becomes important, therefore, to inquire extensively into the movements which have culminated in such a revolution in the civilized world, and, as far as possible, bring them to the test of those incontrovertible facts which universal experience recognizes, and those unquestioned principles of Science which are founded upon Nature, and which I have already endeavored to present. But to accomplish this satisfactorily to all, we must have before us the *modus operandi* through which the innova-

tions have been wrought; and this involves the necessity of calling up the principal Actors and hearing from them their best ground of defense.

We will, therefore, first listen again to BÜCHNER as to the Soul, upon which, as upon all other questions, he is sufficiently explicit. (See Chapter VI.) In his fourth chapter, in his work on "Force and Matter," he says—"We shall have another opportunity of *establishing* the *identity* of the laws of *Thought* with the *mechanical* laws of external nature, of which the former are merely *products*."

To carry out this dogma of the "New Philosophy," there is a constant recurrence in the writings of the materialistic school of the *ad captandum*, the subtle catch-word—"modern science." And although our Author's work on *Force and Matter* presents only a wreck of the sciences, or rather a complete substitution of assumptions in absolute conflict with them, it is the gospel of the writers of the same faith who have sprung up extensively in England, and from whom we have the greatest mischief to apprehend in America. I shall, therefore, supply the reader with other citations from the work, though of a corresponding nature with those already made.

Like other writers of his school, our Author is at great pains to show that no force can exist without matter. This, as I have said, is admitted by all, so far as it relates to the physical condition of this earth and its inhabitants. Hence it is that the Vital Force, being ordained for the perishable organization, when it has fulfilled its purpose, perishes with the structure; and although the continued existence of the Soul, after its separation from the body, is not, like its *substantive existence*, while united with the body, *demonstrable*, yet, from what I shall say when I come to the demonstration of the Instinctive Principle, the *Immortality* of the Soul will follow almost as a logical consequence. A great parade, however, is made about the necessity of matter to force, as a basis for the "New Philosophy," but the premises being always relative to inorganic matter. This universally conceded fact being duly and most tediously argued, the writers are prepared to launch their readers into the "New Philosophy." If the question relate to Organic Life or the Soul, the equivalence or identity of forces having been assumed, it follows, in the for-

mer case, that Organic Beings originated in a "Creative Law" of inorganic nature; or, in the case of the Soul, its phenomena were the mere results of the workings of matter, and that when the body dies the force which was tributary to the phenomena resumes its former condition of caloric, or electricity, &c. If the origin of the universe be the question, "no matter no force" is put in requisition, and therefore there is no Creator of matter. And so with our Author, Dr. BÜCHNER.

"Those," he says, "who talk of a creative power, which is said to have produced the world out of *itself* (creative power), or out of nothing, are ignorant of the first and most simple principle, founded upon experience and the *contemplation of nature.* [But the 'principle' could have had no existence till nature was created.] How could a power have existed *not manifested in material substance*, but governing it arbitrarily according to individual views? Neither could separately existing forces be transferred to chaotic matter, and produce the world in this manner; for we have seen that *a separate existence of either is an impossibility.* The world could not have originated out of *nothing.* A nothing is not merely a logical, but an empirical nonentity. The world, or matter with its properties, which we term forces, must have existed *from eternity*, and must last forever—in one word, the world *can not have been created.*" Such are the *ex post facto* assumptions—predicated of the conditions of matter after its creation. Again, reasoning from man's inability to annihilate matter—therefore, says our Author, "The *immortality* of matter is now a fact *scientifically established*, and can no longer be denied." And as substantiating the inability of any Power to effect its annihilation, our Author quotes the authority of the old heathen Empedocles (450 B.C.), who says—"They are children, or persons with a narrow sphere of vision, who imagine that any thing arises that has not existed before, or that any thing can entirely die and perish." Hence it follows that—"Indestructible, imperishable, and immortal as *matter*, so is also its immanent *force.*"—Having shown that man can not destroy matter, our Author reiterates his logic—"If matter be infinite in *time*, that is, *immortal*, it is also *without beginning* or end in space." "It was no mighty arm reaching down from the ether which raised the mountains, limited the seas, and created man and beast according to pleas-

ure, but it was effected by the same forces which TO THIS DAY PRODUCE hill and dale and LIVING BEINGS; and all this happened according to the strictest necessity."—"What right," he exclaims, "have we to cite the present cultivated human being, standing upon the uppermost step of a ladder of *one hundred thousand years*, as a product of supernatural power?" And he concludes his disquisition upon the Soul by citing the authority of ULE, who says: "Deny, then, who can, that the senses are the source of all truth and of all error, and that the *human mind* IS A PRODUCT OF THE CHANGE OF MATTER."

Our Author devotes a long chapter to "innate ideas," with a reference to the following conclusion: "*If it be correct*," he says, "that there are no innate intuitions, then must the assertion of those be incorrect who assume that the idea of a God, or the conception of a supreme personal being, who created and preserves the world, is innate in the human mind, and therefore incontrovertible by any mode of reasoning."

And as to Miracles—"We find it rather wonderful," says Büchner, "that so clear and acute a thinker as LUDWIG FEUERBACH should have expended so much *logic* in refuting the Christian Miracles. What founder of any religion did not deem it necessary, in order to introduce himself to the world, to perform miracles. Do not the table-spirits belong to the order of miracles? All such miracles are *equal in the* EYE OF SCIENCE"—that is to say, the eye of "Modern Science."

And here is something particularly consolatory to the Infidel as well as the man of faith—"In the face of all these facts," says Büchner, "unprejudiced *philosophy is compelled to reject* the idea of an individual *immortality, and of a personal continuance after death.* With the decay and dissolution of its material substratum, through which *alone* it has acquired conscious existence and become a person, and upon which it was dependent, the (so-called) spirit must cease to exist. EXPERIENCE AND DAILY OBSERVATION TEACH US that the (so-called) spirit PERISHES with its material substratum—that *man dies.*" And for the want of any better foundation for his conclusions, he quotes such authorities as the following. Thus—"'The times have been,' says MACBETH, 'that when the brains were out the man would die, and there an end.' There never has been, and never will be, a real

apparition. 'That the soul of a deceased person,' says BURMEISTER, 'does not reappear after death is not contested by rational people.'" "It is entirely inconceivable that a soul should exist without a brain. It is a fundamental principle—NO MATTER WITHOUT FORCE, NO FORCE WITHOUT MATTER."

Our Author also quotes FEUERBACH more fully, who is worth hearing:

"'No one,' says FEUERBACH, 'who has eyes to see, can fail to remark that *the belief in the immortality of the soul has been effaced from ordinary life*, and that it *only exists* in the *subjective imagination* of individuals still very numerous.'"

And the following monstrous misstatement occurs in connection with the foregoing: "Among the *enlightened* of all nations and times," says Büchner, "the dogma of the immortality of the soul has ever had but *few partisans*, though they made no efforts obstinately to support their opinion like their opponents." Our Author then cites MIRABEAU and DANTON as his chief examples —the former of whom "said, on his death-bed: '*I shall now enter into nothingness;*' and the latter said: '*My residence will soon be in nothingness.*'"

The following is another authority—"During the French Revolution, the celebrated CHAUMETTE erected in the Cemeteries *statues representing Sleep.* The church-yard gates bore an inscription—'DEATH IS AN ETERNAL SLEEP.'"

CONFUCIUS is cited because—"*He says nothing of a heavenly hereafter*"—"BUDDHISM," also, "which counts two hundred millions of disciples, knows nothing of immortality, and preaches *non-existence* as the highest object of deliverance." And our Author rejoices that "*The Mosaic doctrine never points to a reward in heaven* after death."

I shall make but one more quotation in this place, from Büchner's work on "Force and Matter." I have dwelt long upon it, for it is the polar star to all who navigate "the Lake where death and hell were cast." And that this is so will have been inferred from my quotations from his Letter to his English Editor (p. 222), and especially from what we shall have seen of the writings of others. In parting with a Work whose popularity with the learned and the unlearned illustrates the spirit of the age, it would be unjust to his Admirers if I did not present from

his work a good example of the manner in which Materialists endeavor to render their doctrine acceptable to the Spiritualist. Our Author thus:

"*It must certainly be admitted* that the thought of an *eternal life* is more terrifying than the idea of *eternal annihilation.* The latter is by no means repugnant to a *philosophical* thinker. Annihilation, non-existence, is perfect rest, painlessness, freedom from all tormenting impressions, and therefore *not to be feared.*"

Here let us say that, were it not that the "Light of Modern Science" has conducted so many others to the same conclusion, we should charitably conclude that our Author is a Monomaniac. But does not our Author cling to Life, whatever its wretchedness, though relieved at least by his notoriety and success of his work—does he not contradict himself·

> "When he himself might his quietus make
> With a bare bodkin? Who would fardels bear
> To grunt and sweat under a weary life,
> But that the DREAD OF SOMETHING after death—
> The undiscovered country from whose bourne
> No traveller returns—PUZZLES THE WILL,
> And makes us rather bear the ills we have
> Than fly to others which we know not of?"

Notwithstanding Büchner's declaration that—"There is *scarcely any thing printed* (in Germany) in which there is not found some thundering denunciation of the presumptuous materialistic philosophy," there are a few other propagandists of the "New Philosophy" in that region of the world, but chiefly limited to half a dozen. Of these few the distinguished Microscopist, Professor RUDOLF VIRCHOW, is the most responsible. He finds nothing in microscopic cells and blood-globules that are significant either of a Vital Force or a Creator. We will, therefore, hear the best of his reasons and facts:

"It appears to me," he says, "that every rational Physiologist *who assumes an origin of life can not but deduce it* from a joint *action of chemical and physical forces.*" "If the history of our earth shows us that there was a time when no *blastema* [the formative element of simple tissues] existed, or could have existed; when we see that periods arrived in which *the elements combined and became organic forms* (see Chap. VII.), what else can we infer but

that this wonder, this *momentary* manifestation of a LATENT LAW, happened under UNUSUAL CONDITIONS?" Granted the premises, "the unusual conditions must be conceded also." However, "We can *only* IMAGINE," says Virchow, "that at certain periods of the development of the Earth *unusual conditions* existed, under which *the elements, entering into new combinations*, acquired *in statu nascente* vital motions, so that the usual *mechanical conditions were transformed into vital conditions.*" "The Law of their *formation* must necessarily be an ETERNAL LAW, so that *every time when*, in the course of natural processes, the conditions are *favorable* for its manifestation, *organic formation* is realized. The causes of this realization can only be found in a peculiar arrangement of natural relations, in an *unusual* conjoint action of the common elements, and the VITAL PROCESS must, *at its first origin*, be owing to a PECULIAR MODE OF MECHANICAL FORCE."

Such is "Modern Science;" and such, again and again, is the nature of the facts, and of the "New Philosophy," avowedly *imaginary* at its very foundation, which is substituted for a Creative Power, in ruthless defiance of the millions of facts which proclaim such a Power—to say nothing of the contempt which is bestowed upon the multitudinous specific evidences of a peculiar Vital Force, and a substantive self-acting Soul. No one of these evidences is admitted into the discussions in behalf of the "New Philosophy," whether it relate to Organic Life, or the Soul, or the Creator. It is, I reiterate, and I variously show that it is, nothing but a tissue of assumptions and imaginations, in absolute violation of all science, from beginning to end. (See, particularly, Chapters VI. and VII.) But I shall go on to justify these assertions, and to comment as I go.

As to a Creator, VIRCHOW'S opinion is associated by Büchner with that of CZOLBE in the following manner:

"'Are we,' asks Czolbe, 'a single step farther in the knowledge of the supernatural than a thousand years ago? What else do we possess but empty words and names?' 'Hence it follows,' says VIRCHOW, 'that man can only comprehend his own self, and that any thing beyond is transcendental for him.'"

A word now as to the opinion of the Phosphoric Philosopher in the matter of the Soul: "The times," says MOLESCHOTT, "*are past* when Spirit was assumed to exist independently of matter.

But the times are also passing away in which it is contended that spirit is degraded because it manifests itself only in matter." And again: "*Thought is a motion of matter*"—a combustion of phosphorus.

VOGT goes for the doctrine of *secretion*—"Thought," he says, "stands in the same relation to the brain as bile to the liver, or urine to the kidneys." This is pronounced a gross comparison by advocates of the chemical or molecular doctrine. But why more than the latter; or, if Thought *be* a secreted product?

"Whatever," says Burmeister, "may be said of the end of the world, every thing is as vague as the tradition of a beginning, which the *childish intellect* of the peoples has invented. The earth and the world are *eternal*, for this very quality belongs to the essence of matter."—"It is *certain* that the appearance of animal bodies upon the surface of the earth is an expression of such forces [physical forces], a function which results with *mathematical certainty* from existing relations." ! !

The Author of the *Système de la Nature* remarks that—"All unprejudiced individuals will ever feel the force of the axiom that out of nothing nothing can come." That is the burden of the argument. "*Creation*," he goes on, "in the sense of the Moderns, is a *Theological sophism*." Not so with Sir Isaac Newton, who also, as the "New Philosophers" probably know, wrote a profound work upon the Prophecies. And if his conclusion respecting the time of the fulfillment of that which declares the universal acceptance of Christianity be correct, that time is near at hand, when, as Zechariah says, these Gentiles "shall take hold, out of all languages of the Nations, even shall take hold of the skirt of him that is a Jew, saying—We will go with you, for we have heard that God is with you."

Professor BAUMGARTNER teaches, something after the manner of Darwin, that—"The germs of the higher animals *could only be* the eggs of lower animals. The most highly developed animals proceeded *probably* from the eggs of lower animals of the same class; and these, again, from a class beneath. This may have occurred even in Mammalia." To which an insuperable answer has been already rendered (Chap. VII.).

Having now disposed of the principal European continental propagators of the materialistic doctrines, I am prepared to go on

again with their conspicuous followers in Great Britain. Human credulity, the love of what is unusual and startling, and the general propensity to substitute new doctrines for such as have stood the test of the most enlightened inquiry, and the extraordinary success of the "New Philosophy," can form the only justification for attempting the refutation of doctrines which start with the spontaneous origin of living beings in the elements of matter, or which concede their beginning in a "cell" or other "primordial form," and which demand for their very foundation a period of time into which no inquiries can penetrate, and where their propagators can fabricate their assumptions of "protoplasms," "cells," "gemmules," "atavism," "natural selection," &c., with the defiance of all contradiction as *a proof of their validity.*

Herbert Spencer, the distinguished leader of the phalanx in England who stand upon the foundation of the "Correlation and Equivalence of Forces" as alike applicable to all the phenomena of organic and inorganic nature, supplies, in his various writings, another startling exemplification of the atheistical tendency of that doctrine, which he adopts in its greatest latitude. It follows, therefore, that he reduces organic beings, in their essential nature, to a level with inorganic, and that the doctrine culminates in the gravest materialism.

As our Author is a "representative" Philosopher in the so-called "School of Modern Science," I shall introduce his writings rather extensively, having still in view the most substantial ground of Materialism in all its aspects, for the purpose of carrying out most effectually my object of showing the grossness of its assumptions, and that they are in conflict with the established facts and principles in science. He shall have no such cause of complaint as is alleged of others in an Appendix to his Second Part on the *Principles of Psychology* (New York edition, 1870), of whom it is said that—

"The misstatements made by writers who were either too idle to read his books, or incompetent to form estimates of them, he had from the beginning taken as things *to be expected* and endured." But our Author may not expect to propagate his doctrines by extinguishing the light of criticism, as is implied by the following statement, that—"Neither of his last two volumes

has been issued to the Newspapers or the Literary Journals, and his English publishers have now a standing order not to send out for review any future work of his." Very significantly, this Appendix is also affixed to our Author's Answer to the *North American Review*.

I shall introduce my quotations from our Author by a general affirmation, a sort of *test*, from his Essay, the "*Test of Truth*," that the reader may see how far our Author has adhered to the rule which he exacts from others. Thus—

"Metaphysical reasoning is usually vitiated by some covert *petitio principii*. Either the thing to be proved, or the thing to be disproved, is tacitly assumed to be true in the course of the proof or disproof." And the reader will naturally consider how far this is applicable to all that we have hitherto seen of the "New Philosophy."

Taking next his work on the "*Principles of Psychology*," which has been already before us, it will be seen that Mind is "compounded" of sensations, feelings, and emotions. Corpuscular motion in the brain and nerves appears as the only intellectual process, the only source of the phenomena of Mind, and no other cause to institute the motions than physical influences. I shall select for my quotations the most intelligible of our Author's language. In the following extract a parallelism is instituted between Mind and Matter, when nothing can be more obvious than the absence of all relationship between them. But it serves its purpose as a ground for materialism. Thus our Author:

"The nature of Mind, as thus considered, will be elucidated by comparing it with the nature of Matter; and the fact that a parallelism exists between that which Chemists have established respecting Matter and that which we here suppose respecting Mind, will help to justify the conception."

As to the "*Composition of Mind*," upon which our Author has a chapter, he remarks that—"Mind rises to what are universally recognized as its highest developments, in proportion as *it manifests the traits* characterizing *Evolution in general*. [The glandular organs, the liver, kidneys, &c., secrete as perfectly in infancy as at mature age.] A confused sentiency, formed of recurrent pulses of feeling having but little variety of kind, and but little combination, we may conceive as the *nascent Mind possessed by*

those low types in which the nerves and nerve-centres are not yet clearly differentiated from one another or from the tissues in which they lie. At a stage above this, while yet the organs of the higher senses are rudimentary, and such nerves as exist are incompletely insulated, *Mind* is present, probably, under the form of a few sensations, which, like those yielded by our own viscera, are simple, vague, and incoherent. And from this upward, the mental *evolution* exhibits a differentiation of these simple feelings into the more numerous kinds which the special senses yield; an ever-increasing integration of such more varied *feelings* with one another and with *feelings* of other kinds; an ever-increasing multiformity in the aggregates of *feelings* produced; and an ever-increasing distinctness of structure in such aggregates. That is to say, there goes on subjectively a change 'from an indefinite, incoherent homogeneity to a definite coherent heterogeneity;' parallel to that re-distribution of matter and motion which constitutes *Evolution* as objectively displayed."

The following is a fair example of the manner in which Mind is supposed to be *evolved* by molecular changes in the brain, thus placing the Mind as the *consequent*, and not the antecedent of the "molecular change." Thus—

"The degree of revivability of a *feeling* depends, in part, on the extent to which the nervous centre concerned was capable of undergoing much *molecular change, and evolving much of the concomitant feeling*, when the original excitation was received. Several factors co-operate to determine its capability. A complete state of repair is one of them. An active circulation is another. A blood rich in the materials required both for *disintegration* and integration is a third. The respective shares of *these factors* can not be determined; for the three usually vary together." Again: "Other things being equal, a given past feeling may be brought into consciousness vividly, faintly, or not at all, according as the nervous centre concerned is or is not *well repaired* and well supplied *with blood at the moment* the remembrance is suggested." "That strong environing *actions generate* feelings which are more distinctly revivable than those generated by weak environing actions, is also a fact inferable from *physiological* premises. For, as strong environing actions produce strong nervous discharges and great amounts of those *central molecular changes of which feel-*

ings are the CORRELATIVES, it is obvious that they must produce, in high degrees, those *structural changes*, whatever they may be, *to which* the revivability of the feelings *is due.*"

The foregoing quotations require no farther comment than that with which they were introduced. The following paragraph is intended to show us how the brain regulates mental associations. But the reader should keep in mind that all that is said of molecular actions, nervous changes, nervous discharges, is mere assumption, and that we know nothing of the manner in which the brain is tributary to mental processes. Our Author thus:

"The associability of *feelings* with those of their own kind, group within group, corresponds to the general arrangement of nervous structures into great divisions and subdivisions. The central *feelings* arise within the great cerebral masses; and the subjective connection shown in the instant association of each with its class answers to the objective connection between one set of nervous actions occurring in these great masses and sets of nervous actions that have occurred in the same masses. The *peripheral feelings*, again, *initiated by disturbances upon or within the body*, have their seat in the subjacent nervous mass or masses, but *probably the medulla oblongata* is the *sole* sensational centre; and the classing of one of these *feelings* with sensations in general instead of with emotions, answers to the connection between one nervous change in this subjacent mass and other nervous changes in it."

Throughout the work on the "Principles of Psychology," we meet with no allusion to a Principle or Essence known as the Soul or Mind by the opponents of Materialism—nothing but brain and nerves and molecular action, and exciting causes of a physical nature. But let us hope for something more encouraging in some other of our Author's writings—his "*First Principles*," for example. But here he says that—

"The *Forces* which we distinguish as *Mental* come within the *same generalization* [as the external physical forces]. Yet there is no alternative but to make the assertion." "Besides the Correlation and *Equivalence* between *external physical forces* and the *Mental Forces generated by them* in us under the form of sensations, there is a Correlation and Equivalence between sensation and these physical forces, which, in the shape of bodily actions,

result from them." "And how, it may be asked, can we interpret by the law of Correlation the *genesis* of those *thoughts* and *feelings* which, instead of following external stimuli, arise spontaneously?" "The FORCES called *vital*, which we have seen to be *correlates* of the forces called *physical*, are the IMMEDIATE SOURCES of *those thoughts and feelings*, AND ARE EXPENDED IN PRODUCING THEM. [No other Soul.] It is a conspicuous fact that mental action is contingent on the presence of a certain nervous apparatus. Further, this apparatus has a particular *chemical* constitution on which *its activity depends*, and there is one element in it between the amount of which and *the amount of function* performed there is *an ascertained* connection, the proportion of *Phosphorus* present in the brain being the smallest in infancy, old age, and idiocy, and the greatest during the prime of life." But I may say that there is no foundation whatever for the alleged disproportion of that luminous element. (See Analysis, &c., Chap. VI., VII.). As to Moleschott's dogma—"Without Phosphorus there is no Thought," Liebig turns it into ridicule, and is inclined to think, upon that hypothesis, the bones should be regarded as the source of thought, since they contain four hundred times more phosphorus than the brain. But it is very probable that there are varying proportions of different elements not only in the brain but in all the organs during their progress towards a state of maturity. But this supplies no proof that the brain is not the seat of a Soul. It only shows that a certain maturity of the organ is necessary to the active operations of Reason; and this was never doubted. The assumption is simply equivalent to saying that, *without brain* no *Thought*. Moreover, there is no reliance to be placed upon the chemical analyses of which the foregoing assumption is predicated; according to the admissions of organic Chemists.

But the Author of the phosphorus doctrine should have adhered more consistently to the facts and principles of Chemistry. The combustion of phosphorus arises from its union with oxygen gas, and always terminates in one way. If oxygen, therefore, unite in the manner supposed with the phosphorus of the brain, it can form no other compound than phosphorous or phosphoric acid; or, if the oxygen combine with the carbon or the hydrogen of the brain, the resulting compounds must be carbonic acid in

one case, and water in the other; or at most, a special triple compound of those elements. A similar demonstration is applicable to all the purely physical processes of the brain whose results have been so absurdly exalted from their established physical conditions to the generation of the phenomena of Mind.

To go on with our Author. In his work on Psychology, he has a similar interpretation of the Emotions as we have seen of Thought; though he appears to make no distinction between them. Thus—

"The centres which are the seats of the Emotions undergo disintegration in the *genesis* of Emotions; and, other things remaining equal, thereupon become less capable of GENERATING Emotions until they are reintegrated."

There is much in our Author's works of what we have just seen about the Correlation of Sensations and external influences. But suppose that the brain itself and alone perceives the impressions—sees, hears, feels—what is it, I reiterate, that contemplates the beauties of a landscape in all its minutest details, and with emotions of delight, perhaps of reverential awe? What carries on the long train of reflections that have been instituted by some momentary impression upon the brain through the avenue of the Senses? Where shall we look for an *exciting cause* of those reflections that are at our command for hours, days, and years after the sensations have ceased to operate? Or where for an exciting cause of the reproduction in our Minds of the knowledge that is independent of sensation? Or where for the Actor's ability to repeat, from memory, all the Plays of Shakspeare? Are all the things of past sensations, all our acquired knowledge, engraven upon the brain?—for so it must be if there be any truth in Materialism. Sensation is, of course, a favorite starting-point with the Materialist; but all ground, even for sophistry, being removed when he comes to the processes of Reason, where there is no apparent cause to initiate a single idea, he plants himself upon the *self-originating* "molecular action" which he violently predicates analogically of that hypothetical "molecular action" in other organs which, if it have any existence beyond the vital decomposition of organs, he admits is *excited by the blood!* But assumptions are our Author's only means of escape from the interrogatory which he anticipates—

"How, it may be asked, can we interpret by the law of Correlation the *genesis* of those *thoughts* and *feelings* which, instead of following external stimuli, arise spontaneously?" To which he responds—"The forces called *vital*, which we have seen to be *correlates* of the forces called *physical*, are the *immediate sources* of those thoughts and feelings, and are expended in producing them."

Here we have the common physical forces of external nature, acting as vital forces in instituting cerebral action, assigned as "the immediate source of *spontaneous* thought and feelings," just as they are assumed to act in the production of bile, sweat, &c. But mark, in the latter case the blood is an indispensable exciting cause of the vital force, while no exciting cause of the forces is assigned in the case of the Mind, but, like the Soul, we are left to suppose them self-acting. Moreover, our Author's inconsistency becomes more surprising when it is considered that he triumphantly produces an exciting cause of the same forces for another class of thoughts and feelings—namely, SENSATION arising from impressions made upon the brain by physical influences propagated through the senses. He goes on to enforce the doctrine of Materialism by a variety of pure assumptions, as follows:

"Various classes of facts unite to prove that the *Law of metamorphosis* which holds among *physical* forces holds *equally between* those and the *Mental* forces. Those *modes* of the unknowable which we call motion, heat, light, chemical affinity, &c., are *alike transformable into each other* and INTO THOSE MODES of the *Unknowable* which we distinguish as SENSATION, EMOTION, THOUGHT; *these, in their turn*, being directly and indirectly RETRANSFORMABLE into the original shapes."

The same doctrine of force is carried by our Author into all the affairs and conditions of Life; and the very force expended by a horse or a roaring hurricane may become the source of our Thoughts, Emotions, &c. Thus our Author:

"Not only is the force expended by the horse harnessed to the plough, and the laborer guiding it, derived from the *same reservoir* as is the force of the falling cataract and the *roaring* hurricane; but to *this same reservoir* are eventually traceable the subtler manifestations of force which *human society*, as socially constituted, *evolves*."

But such is not the end of the doctrine of the "Correlation and Conservation of Forces;" for it is employed, as we have already seen, to beguile Mankind into a rejection of the Deity, and our Author joins in this enterprise, as will appear from the following declaration, which, for the sake of the disinterested opinion that accompanies it, I take from the New York EVANGELIST of September 23, 1869, where it stands as an isolated paragraph. Thus—

"A DISTINCT AVOWAL.

"No one need read Herbert Spencer with any doubt of the fact that in so doing he steps into a poisonous atmosphere, against whose careless inhalation he should be on his guard. There is no necessity of testing it to detect its character. Mr. Spencer, in a late article, labels his infidelity in plain English himself. He says—'The absolute commencement of Organic Life on the globe I distinctly deny. The affirmation of universal evolution is in itself the negation of an absolute commencement of any thing.'"

The following is even a more "distinct avowal."—"Is it supposed," he says, "that a new organism when created is created out of nothing? But this supposes the creation of matter, and *the creation of matter is inconceivable.* It implies a relation between something and nothing, an idea that can not be formed into coherent thought." Those who think they believe it "do not really believe, but rather believe that they believe." He regards the doctrine as "worthless and absurd."

The foregoing quotations remind us of our Author's answer to the *North American Review*, a pamphlet entitled "*Spontaneous Generation*," in which he denies the grave impeachment of advocating that doctrine. But the quotation from the EVANGELIST, which, remarkably enough, appears in almost the same words in the Answer to the *Review*, goes even farther than *generation*, and shows us how much denials are worth when an odious doctrine is designated by a name that is intelligible to the multitude. But our Author's Answer is so much of a literary curiosity, and embraces so admirable a definition of Spontaneous Generation, taking "Modern Science" for its basis, and conveys so exactly our Author's faith in spite of his denial, that I shall present its gist to the reader; and farther, also, that it may be compared with the demonstrations which I have made against the doctrine. Of course, as I have shown (p. 187), Chemistry has

manufactured no such Organic Compounds as our Author supposes, and which forms the scientific basis of the doctrine which he acknowledges. But granting this to be true, it will not affect in the least the hypothesis of Spontaneous Generation. The coalescence of an element with an inorganic or binary compound, or inorganic compounds with each other, and resulting in ternary, quaternary, &c., compounds, and ultimately in complex living beings, is just as much an act of Spontaneous Generation or Spontaneity of Living Beings (for they are equivalent terms), as the doctrine which begins altogether with the elements of matter. There is no difference whatever between them. In all the cases the union is of inorganic substances, and is necessarily assumed to be effected through the properties or forces of inorganic matter, which are then said to become correlated or metamorphosed into vital force and mental force. But here is our Author to speak for himself. Thus—

"The conception of a first organism, in any thing like the current sense of the words, is wholly at variance with conception of evolution." "That organic matter was not produced all at once, but was reached through steps, we are *well warranted* in believing *by the experiences of Chemists.* [!!!] Organic matters are produced in the laboratory by what we may literally call *artificial evolution.* Chemists find themselves unable to form those complex combinations *directly from their elements;* but they succeed in forming them indirectly, by successive modifications of simpler combinations. In some binary compound, one element of which is present in several equivalents, a change is made by substituting for one of these equivalents an equivalent of some other element; so producing a ternary compound. Then another of the equivalents is replaced, and so on." The foundation being thus laid by the Chemist, Mr. Spencer has no difficulty in resolving that "*Mystery* of *Mysteries, Organic Life,*" and thus, also, placing Theoretical Geology under the highest obligations to Chemistry. The following is his luminous exposition:

"The progress towards higher types of organic molecules is effected by modifications upon modifications; *as throughout Evolution in general.* Each of these modifications is a change of the molecule into equilibrium with its environment—an adaptation, as it were, to new surrounding conditions to which it is sub-

jected; *as throughout Evolution in general.* Larger, or more integrated, aggregates (for the compound molecules are such) are successively generated; *as throughout Evolution in general.* More complex or heterogeneous aggregates are so made to arise, one out of another; *as throughout Evolution in general.* A *geometrically*-increasing multitude of those larger and more complex aggregates so produced at the same time results; *as throughout Evolution in general.* It is by the action of the successively higher forms on one another, joined with the action of environing conditions, that the highest forms are reached; *as throughout Evolution in general.*" "In the early world, AS IN THE MODERN LABORATORY, inferior types of organic substances, by their mutual actions under fit conditions, evolved the superior types of organic substances, ending in organizable protoplasm. And it can hardly be doubted that the shaping of organizable protoplasm, which is a substance modifiable in multitudinous ways with extreme facility [chemically], went on after the same manner."

Such, then, is the only proper meaning of "Spontaneous Generation;" and if our Author chooses to give to it some other interpretation, his own doctrine is the most *materialistic* and *pantheistic* that can be devised. "Words," says Lord Bacon, "are often like a Tartar's bow which shoots backward, and so sometimes tangle the judgment of those who use them." Nor will the assumption of a scientific foundation, and placing Chemistry on an equality with Creative Power, save our Author from the horn of the dilemma upon which he has impaled himself. But he has only expounded a doctrine which lies at the basis of Theoretical Geology—"the typical system" or progressive development of living beings from the lowest to the highest. Any farther comment here is superseded by what has been already said, particularly in our Seventh Chapter, of the absolute conflict with the fundamental facts and laws of Nature of every doctrine relative to the origin of organic beings that departs from the Mosaic.

I now return to our Author's "First Principles," from which we have seen how he prepares the reader for a final plunge into Atheism; and the same foundation is laid in other writings. Examples of this may be derived from his "Principles of Biol-

ogy," which I shall quote liberally, not only in justice to the eminent Author, but that my readers may appreciate the nature of the facts and arguments of this Representative of the "New Philosophy." Thus, then, speaking after the manner of Theoretical Geology, he says—

"Besides the types [of organic beings] that have persisted from ancient eras down to our own era, other types have from time to time made their appearance in the ascending series of our strata —types of which some are lower and some higher than the types previously recorded; but *whence these new types came*, and whether any of them came by divergences from the *previously recorded type*, the evidence does not yet enable us to say."

And here is an argument for "the affirmation of universal evolution."—"Passing," he says, "to distributions in time, there arises the question—Why, during nearly the whole of the vast period geologically recorded, have there existed none of those highest organisms which have now overrun the earth? [We shall see that such did exist.] How is it that we find no traces of a creature endowed with large capacities for knowledge and happiness? The answer that the Earth was not, in remote times, a *fit habitation* for such creatures, besides being *unwarranted by the evidence*, suggests the equally *awkward question*, Why during untold millions of years did the Earth remain *unfit for inferior* creatures?"—in which I cordially agree.

And yet another step—"The *hypothesis* that living beings resulted from special creations being a *primitive hypothesis* [Mosaic], is probably an *untrue hypothesis*. If the interpretations of Nature given by aboriginal men were erroneous in other directions, they were most likely to be erroneous in this direction." "*It belongs to a family of beliefs which have, one after another, been destroyed by advancing knowledge.*" "*It is a belief that is not countenanced by a single fact.*" (See Chapter VII.) And here is our Author's characteristic argument: "*No one ever saw* a special creation, *no one ever found proof of an indirect kind* that a special creation had taken place." (See, again, Chapter VII.) "The old Hebrew idea that God takes clay and *moulds a creature as a potter might mould a vessel*, is probably *too grossly absurd* to be accepted by any modern defender of the special creation doctrine. But having abandoned *this crude belief*, what belief is he prepared to substitute?"

"If divine power is demonstrated by the simple creation of each species, would it not have been *still better demonstrated by the separate creation of each individual?*" "The belief that all organic forms have arisen in conformity with *uniform Laws*, instead of breaches of uniform laws, is a belief that has come into existence *in the most instructed class*, living in these better instructed times."

In his "First Principles," our Author remarks that—"The Law of *organic evolution* is the Law of *all evolution*, whether it be in the development of the Earth, in the development of *Life upon its surface*, in the development of Society, of Government, of Manufactures, of Commerce, of Language, Literature, Science, Art." "Manifestly, this community of results implies *community of causation*. It may be that of such causation no account can be given," &c. And our Author very justly concludes that—

"Men who have not risen above that vulgar conception which unites with matter the epithets of '*gross*' and '*brute*,' may naturally enough *feel dismay* at the proposal to reduce the phenomena of Life, Mind, and Society *to a level* with those which they think so degraded."

And yet we have just seen the most debasing assault upon this same matter, as well as upon the Creator, with the very epithets now thrust in our faces, in our Author's declaration that—

"The old Hebrew idea that God *takes clay* and moulds a creature as a potter might mould a vessel, is too GROSSLY absurd to be accepted by any modern defender of the special creative doctrine."

And now another climax—a *primordial cell*, and its "evolution into living beings"—defining how the "*affirmation* of universal evolution is, in itself, the *negation* of an absolute commencement of any thing;" however inconsistent this may be with what we have just seen of our Author's flounderings in the creative pretensions of the Chemist. Thus, in his "Biology"—

"If a *single cell*, under appropriate conditions, becomes a man in the space of a few years [that is to say, through the established course of generation], there can surely be *no difficulty* in understanding how, *under appropriate conditions*, *a cell* may, in the course of untold millions of years, give origin to the human race."

"Under *appropriate conditions*, for untold millions of years,"

is an argument worthy of such a cause. Such, precisely, also, is the ground of Darwin's "Origin of Species"—the only cause assigned being "untold millions of years." For the present, I ask the reader whether he can imagine any other "appropriate conditions" for the development of the human cell or ovum than that precise complex organism which has been designed with a special reference to a mature development of the cell in the space of nine months? And whether, also, he can imagine any other "appropriate" nourishment for the growth and development of that cell than the human blood, and supplied as in the existing manner? And then as to the nutritive qualities of inorganic matter, and the fostering, motherly care of the destructive forces of inorganic nature, see Chapter VII. I may now, also, convict our Author and his school of the "New Philosophy," upon their own premises, of the most palpable violation of their fundamental principles. They insist upon an established uniformity of the laws of Nature, and that under these laws the whole organic kingdom has been developed, either from the elements of matter, or from a primordial form or cell. How happens it, then, that there now exists a totally different set of laws for the generation and development of animals and plants? Why have not the laws of inorganic nature, as it respects their assumed creative function, maintained their "established uniformity" instead of undergoing a total transmutation, or, as our Author expresses it, "breaches of uniform laws?" Or, equally absurd and fatal to the developmental hypotheses is the assumed co-existence of the two contradictory classes of laws; one for the production of animals and plants out of the elements of matter, or a given primordial cell, by the laws of inorganic nature, and another for the generation and development of a cell by the laws of organic nature. (See the old heathen doctrine, p. 240.) What shadow of analogy, I again say, is there between such a wonderful and elaborate system of consummate Design as is provided for the perpetuation of animals and plants, ingrafted upon the whole organic mechanism, and the riotous, destructive forces of inorganic nature—through "untold millions of years"—and without contributing to the development of animals a particle of nourishment. (See Chapter VII.) And yet such is a fundamental ground in the "New Philosophy"—this monstrous assumption

shocking the scientific mind as well as the common dignity of human nature, in the writings of all who aspire at a rank in the "New Philosophy," or as otherwise disguised under the name of "modern science." As it relates to our Author, it reminds one, also, of his more direct method of disposing of the Deity than we have yet seen. In his "First Principles," Mr. Spencer says that—

"As writes Mr. Mansel—'*It is our duty, then, to think of God as personal;* and it is our duty *to believe that He is infinite.*'—That this is *not the conclusion here adopted* needs hardly be said. Our duty is to submit ourselves with all humility to the *established limits* of our intelligence, and not perversely to rebel against them."

In "all humility" I rejoice that, in common with all believers in a God, I have no more doubt of His Personality than I have of my own. And I have already argued, apart from Revelation, the Personality of a Spiritual God upon the same ground as the personality of a human being (Chap. VIII.). If a God have an existence, His Individuality, and therefore His Personality, is as absolute as that of man. Hence, to deny His Personality is a direct avowal of atheism, whatever prevarication may be employed. The term is just as applicable to immaterial existences as to material.

The spirit of the foregoing sentiment pervades our Author's writings; and it rouses one's faith to indignation on observing how he satirizes the believer in a God, and even the Deity Himself, while affecting an admission of such a Being for the very purpose of destroying that belief. Thus, in his "Principles of Biology"—

"We have the most unmistakable proof that throughout all past time there has been a perpetual preying of the superior on the inferior animals—a ceaseless devouring of the weak by the strong. How is this to be explained? How happens it that animals were so designed as to render this bloodshed necessary? How happens it that in almost every species the number of individuals annually born is such that the majority die of starvation, or by violence after arriving at maturity?" "Whoever contends that each kind of animal was *especially designed* must assert either that there was *a deliberate intention* on the part of the Creator to

produce these results, or that there was *an inability* to prevent them. Which alternative *does* he prefer? To cast an imputation upon the Divine character, or assert a limitation of the Divine power?"*

The same interrogatories and the same objections are equally applicable to the creation of man—nay, more so on account of his Reason. Why was he created with a disposition, or with the ability, to rebel against his Creator, and this, too, at his very entrance upon existence? Why, to butcher each other? Why, like the cannibals, to eat each other? Why destined to sorrow and suffering, though not exactly "as the sparks fly upward?" Why are "the nations as a drop in the bucket, and counted as a small dust in the balance?" And, most remarkable of all, why does the Creator indulge His rational creatures in attempts to reason Himself out of existence? Nor is the blasphemy in the least degree mitigated by referring the origin of living beings to the laws of nature, so long as a Creator is admitted to have endowed those laws with a creative power. "*Qui facit per alium, facit per se.*" From which it again follows that our Author and his school entertain no belief in a Creator. And this is sufficiently obvious from the inconsistent manner in which he would, by this mode of reasoning, entrap the unwary reader. We have already had the bait—here is the trap:

"That sentiment which the doctrine of *special creations* is thought necessary to satisfy is much better satisfied by the doctrine of *Evolution* [through 'untold millions of years'], *since this doctrine raises no contradictory implications respecting* the UNKNOWN CAUSE, such as are raised by the antagonistic doctrine."

"UNKNOWN CAUSE" is a most appropriate designation for such an hypothesis, without even the merit of the "devotions, and the altar, and the *Unknown* GOD" of the Athenians. But let us see how far the terms of our Author's philosophy are consistent; for it is important that the confiding reader (for whose

* Büchner has similar arguments in the way of interrogatories. Thus—"Who would seriously maintain that the earth could not have been more comfortable for man? With what difficulties must he not struggle until he renders a little spot fit for a dwelling-place, &c. No being can have been destined to live merely for the good man. All that lives has an equal right to exist; and it is merely the *right of might* which permits man to kill other living beings."

benefit, particularly, I am writing) should understand the nature of the precipice to which he has been conducted. In doing this, I will adopt our Author's Socratic style of interrogatories. I ask him, then, to explain the difference between a Creator who, "with deliberate intention, or from inability to do otherwise," created animals of ferocious disposition "to prey upon the inferior, the strong to devour the weak, or to die of starvation" (including man in the category), and a Creator who, with the same "deliberate intention, or from an inability to do otherwise," *so endowed the material world with forces and "uniform laws reflecting intelligence,"* as to develop man and animals with those same ferocious dispositions, and the same liabilities to starvation, shipwreck, carnage, suffering, and certain death? "Which alternative does our Author prefer? To cast an imputation upon the Divine Character" for having so created man and animals, or so contrived a set of "uniform laws" that produced the same results, or "assert a limitation of Divine Power" in either of these particulars? The same "contradictory implications respecting the *unknown cause*" obtain equally in either case. Which horn of the dilemma, I say, will our Author choose? For upon one or the other he has impaled himself. Our Author, however, is only a Representative of a powerful School, whom I employ as its Interpreter. But I will no farther criticise his alternative, and will conclude my answer to his interrogatories in the language of a high Authority, which I can not doubt will prove very satisfactory.

"My thoughts are not your thoughts, neither are your ways My ways, saith the Lord. For as the heavens are higher than the earth, so are My ways higher than your ways, and My thoughts than your thoughts," and so on to the end of the chapter.

But let us hear our representative Author a little farther upon this interesting topic. He tells us that—"We everywhere see fading away the *anthropomorphic* conception of the UNKNOWN CAUSE. In one case after another is abandoned that interpretation which ascribes the phenomena to a Will analogous to the human Will."

Here our Author brings up a question of vital importance—that of reasoning from ourselves to the Deity: "We everywhere

see fading away the *anthropomorphic* conception of the *Unknown Cause*," &c.*

The first comment suggested is, that the epithet *anthropomorphic*, as here applied, is acknowledged by the Believer only in its relation to Mind; and I fully disposed of it when arguing the Spirituality and Personality of God (Chap. VIII.). The main point of consideration relates to the assault upon our only mode of obtaining a knowledge of the "Unknown Cause," independently of Revelation. By reasoning from our own Will to the Will of the "Unknown," by reasoning from our own designs, our own conceptions of virtue, goodness, love of our fellow-creatures, and by extending the elements of our Reason to infinity, we obtain as clear a conception of the Supreme Being as we have of ourselves. The constitution of our Minds represents the "Image of God," not our bodies. And all this, too, without the slightest "anthropomorphic" grossness.

But the Infidel rejoins—You shall carry along the evil with the good, and impute to your God the vices and infirmities as well as the virtues and intellectual characteristics of mankind. You must reason to your God as well from the former as the latter, and extend them all to infinity. You must admit that He was either cruel in creating man and animals with combative dispositions, or that He was unable to do otherwise. As to Designs, they must be weighed along with the alternative here presented.

The credulous and confiding are confounded by the sophistry. They shrink from the dark side of the alternative. They close the Sacred Volume in the very face of the historical Prophets and Apostles, and in helpless imbecility they "say in their hearts there is no God!"

Another important Authority in the School of the "New Philosophy" is Professor JOHN TYNDALL, whose Address at the meeting of the British Scientific Association, 1868, I have already freely quoted in regard to his identification of organic and inorganic beings as it respects their essential nature; and we

* "LUDWIG FEUERBACH," says Büchner, "calls all conceptions of God and divinity *Anthropomorphisms*—that is, products of human fancies and perceptions, formed after the model of human individuality." It is probably from this source our Author derives his sarcastic epithet.

will now hear him, from the same Address, on the questions just before us. No comment, however, is required upon the following statement:

"If you ask the Materialist WHENCE is this '*matter*' of which we have been discoursing, *who* or *what* divided it into molecules, *who* or *what* impressed upon them *this necessity of running into Organic Forms*, he has no answer. Science is also mute in reply to these questions. But if the *Materialist* is confounded and science rendered dumb, *who else is entitled to answer? To whom has the secret been revealed? Let us lower our heads and* ACKNOWLEDGE OUR IGNORANCE, ONE AND ALL. Perhaps the mystery may resolve itself into knowledge at some future day. The process of things upon this earth has been one of amelioration. It is *a long way* from the Iguanodon and his cotemporaries to the President and Members of the British Association. And whether we regard the improvement from the scientific or from the theological point of view, as the result of progressive development or as the result of successive exhibitions of creative energy, neither view entitles us to assume that *man's present faculties* end the series—that the process of amelioration *stops at him.* A time may, therefore, come when this ultra scientific region by which we are now enfolded may offer itself to *terrestrial*, if not to *human* investigation." "Rays may now be darting which require but the *development of the proper intellectual organs* to translate them into *knowledge as far surpassing ours as ours does that of the wallowing reptiles* which once held possession of this planet."

And all this without even the ability to surmise—"WHO or WHAT impressed upon the *molecules of matter* the necessity of *running into Organic Forms.*"!! Nevertheless, we are encouraged beyond Darwin himself, that a higher race of beings may yet be developed with "intellectual organs that will translate them into a knowledge" of "Who or What" was the Author of "the mystery of mysteries"—nay more, of "*whence* is this *matter.*"

Let us, next, again interrogate Professor T. H. HUXLEY, now President (1869) of the "British Association for the Advancement of Science." Whatever exposition, therefore, this representative Author may make in behalf of Materialism must be regarded, like the writings of the Authorities already cited, as embracing the most substantial facts and arguments that the inge-

nuity of man has yet invented. For the intended purpose I shall introduce the following extracts from the Yale College edition of our Author's celebrated Lecture on the "Physical Basis of Life" (1868), already quoted (with an Introduction, according to the College Advertisement, by a Professor of the College); and of which the New York EVENING POST, of May 10, 1869, remarks that—

"It may be considered rather '*strong meat*' for College circulation, as the tendency of Professor Huxley's argument is to show that the Soul of man, if he have any, is but the product of physical organization—is a series of actions and states of the brain and nervous system."

We have already had this distinguished writer before us, particularly in our fourth chapter, in connection with the question now under consideration; and the citations there should be taken along with the following facts and arguments. The President farther says that—

"A solution of *smelling salts* in water, with an infinitesimal proportion of some other saline matters, contains all the elementary bodies which enter into the composition of protoplasm; but, as I need hardly say, a *hogshead* of that fluid would not keep a *hungry* man from starving, nor would it save any animal whatever from a like fate. An animal can not make protoplasm, but must take it ready made from some other animal, or some plant. In seeking for the origin of protoplasm, we must eventually turn to the vegetable world. The fluid containing carbonic acid, water, and ammonia [the 'smelling salts'], which offers such a Barmecide feast to the animal, is a table richly spread to multitudes of plants; and with a due supply of only such materials, many a plant will not only maintain itself in vigor, but grow and multiply until it has increased a million-fold, or a million million-fold, the quantity of protoplasm which it originally possessed." "Plants are the accumulators of the power which animals distribute and dispense. But it will be observed that the existence of the matter of life depends on the pre-existence of certain compounds, namely, carbonic acid, water, and ammonia. Withdraw any one of these three from the world, and all vital phenomena come to an end. They are related to the protoplasm of the plant as the protoplasm of the plant is to that of the animal. Carbon, hydrogen,

oxygen, and nitrogen are all lifeless bodies. Of these, carbon and oxygen unite in certain proportions, and under certain conditions, to give rise to carbonic acid; hydrogen and oxygen produce water; nitrogen and hydrogen give rise to ammonia. These new compounds, like the elementary bodies of which they are composed, are *lifeless.* But when they are brought together under certain conditions, they give rise to the still more complex body, protoplasm, and this protoplasm *exhibits the phenomena of life.* I see *no break* in this series of steps in *molecular complication*, and I am unable to understand why the language which is applicable to any one term of the series may not be used to any of the others."

Here is our Author's first fallacy. "He sees *no break* in the series of steps in molecular complication," but jumbles together the union of two elements into lifeless *binary* compounds in virtue of their own inherent *physical* properties, and the union of carbon, hydrogen, oxygen, and nitrogen, into a *quadruple* living compound in virtue of the organization and *vital* properties of the plant, and which nothing can effect but that living organization. And yet is this utter perversion of facts regarded as a very conclusive demonstration of the common nature of organic and inorganic beings. But this is only a *demonstrative* step to the higher branch of materialism. Before reaching that climax, however, our Author has something more of the same delusive reasoning as to the common nature of inorganic matter and living beings. He goes on to say that:

"We think fit to call different kinds of matter carbon, oxygen, hydrogen, and nitrogen, and to speak of the various powers and activities of these substances as the *properties* of the matter of which they are composed. When hydrogen and oxygen are mixed in a certain proportion, and the electric spark is passed through them, they disappear, and a quantity of water, equal in weight to the sum of their weights, appears in their place. There is not the slightest parity between the passive and active powers of the water and those of the oxygen and hydrogen which have given rise to it." "Nevertheless, we call these and many other strange phenomena the properties of the water, and we do not hesitate to believe that, in some way or another, *they result from the properties of the component elements of the water.* We do not assume

that *a something* called *aquosity entered into* and took possession of the oxide of hydrogen as soon as it was formed, and *then guided* the aqueous particles to their places in the facets of the crystal, or amongst the leaflets of the hoar-frost."

All of which is very true. But, still ignoring the elaborate organization of plants and all their unique phenomena, but admitting that no organic compound can be formed out of the elements of matter excepting by that organization, the foregoing reasoning is again violently applied in the manner already seen. Thus—

"Does any body quite comprehend the *modus operandi* of an electric spark, which traverses a mixture of oxygen and hydrogen? *What justification is there, then, for the assumption of the existence in the living matter of a something which has no representative or correlative in the not living matter which gave rise to it? What better philosophical status* has 'VITALITY' than AQUOSITY?"

Now it is conceded by our Author, and by most Materialists, that plants alone can organize mineral substances into compounds as simple as protoplasm, and therefore there could have been no organic compound as simple as that substance till the appearance of plants; and therefore, also, there could have been no plants unless created by a Power superior to nature. It is not true, then, that we "assume that a something called '*Vitality*' entered into and took possession of the elements of matter" and raised them to organic compounds, but we show that the *plants* organized the elements and infused Life into them. We show, by the materialistic premises, that there was not an *originally* acquired Life by the elements—that no "something called '*Vitality*' entered into them" from a vague source—but a Life derived from the vegetable organism. There was no "aquosity" about it. And "there's the rub!"—a special Act of Creation, for the special purpose of organizing mineral substances, and flowing irresistibly from the premises of the Materialist. Our Author then goes on with his sarcastic remarks upon Vital Physiologists, which, however, would be quite unimportant were they not mistaken by many others as fatal thunder-bolts:

"And why should '*Vitality*' hope for a better fate than the other 'ITYS' which have disappeared since Martinus Scriblerus accounted for the operation of the meat-jack by its inherent

'meat-roasting quality,' and scorned the 'materialism' of those who explained the turning of the spit by a certain mechanism worked by the draught of the chimney? If *scientific* language is to possess a definite and constant signification whenever it is employed, it seems to me that we are logically bound to apply to the protoplasm, or physical basis of life, the same conceptions as those which are held to be legitimate elsewhere. If the PHENOMENA exhibited by *water* are its PROPERTIES (?), so are *those* presented by protoplasm, *living* or *dead*, its PROPERTIES. [!] If the properties of water may be properly said to result from the nature and disposition of its component molecules, I can find no intelligible ground for refusing to say that the *properties* of protoplasm *result* from the nature and disposition of its molecules. But I bid you beware that, in accepting these conclusions, you are placing your feet on the first rung of a ladder which, in most people's estimation, is the reverse of Jacob's, and *leads to the antipodes of heaven*. It may seem a small thing to admit that the dull vital ACTIONS of a fungus, or a foraminifer, are the PROPERTIES of their protoplasm, and are the direct results of the nature of the matter of which they are composed. But if, as I have endeavored to prove to you, their protoplasm is essentially identical with, and most readily converted into, that of any animal, I can discover no logical *halting-place* between the admission that such is the case, and the *farther concession* that all vital action may, with equal propriety, be said to be the result of the molecular forces of the protoplasm which displays it. [No reference to the organic *mechanism*.] And if so, *it must be true, in the same sense and to the same extent, that the* THOUGHTS *to which I am now giving utterance*, and YOUR THOUGHTS *regarding them, are the* EXPRESSIONS OF MOLECULAR CHANGES *in that matter of life which is the source of* OUR OTHER VITAL PHENOMENA. Past experience leads me to be tolerably certain that, when the propositions I have just placed before you are accessible to public comment and criticism, they will be condemned by many zealous persons, and perhaps by *some few* of the wise and thoughtful. I should not wonder if '*gross and brutal materialism*' were the mildest phrase applied to them in certain quarters. And *most undoubtedly the terms of the propositions are distinctly materialistic*." "The fundamental doctrines of materialism, like those of spiritualism and

most other *isms*, lie outside 'the limits of philosophical inquiry,' and DAVID HUME'S great service to humanity is his irrefragable demonstration of what these limits are. Hume called himself a *skeptic, and therefore others can not be blamed if they apply the same title to him;*" and our Author applauds his skepticism. Where's the difference? "But," says our Author, "that does not alter the fact that the name, with its existing implications, does him gross injustice. [!] If a man asks me what the politics of the inhabitants of the MOON are, and I reply that I do not know; that neither I, nor any one else have any means of knowing; and that, under these circumstances, I decline to trouble myself about the subject at all, I do not think he has any right to call me a skeptic."

Certainly not; but suppose one has been publicly inculcating doctrines that would extinguish the light both of Nature and of Revelation—what then? And suppose that Hume had denied his infidelity, or had prevaricated about it—what then? I will answer for both Hume and Huxley, in the language of Ralph Waldo Emerson, that—

"It is impossible to conceal your opinion. Your opinion is known by the very attempt of concealment; for when an opinion seeks the darkness, you know what that opinion is. He must be a very strong man who can hide his inclination. People can't get away from their brain or their affection."

So Hume and Huxley wisely complied with the exigencies of the "materialistic terminology," while a denial would be simply an act of timidity designed to avert the anticipated charge of "*gross and brutal materialism.*" Nevertheless, the very anticipation of the charge is a proof of its justice; and that the Materialist shrinks from it is a proof that his ground is indefensible. I may say, too, that it is a general expedient among writers of this denomination, after having carried out their intended purpose of undermining our faith, to resort to the subterfuge of declaring that they inculcate "neither spiritualism, nor materialism, nor theism, because the terms are unintelligible, and we know no more of the *nature* of spirit than we do of the *nature* of matter," or of the "Politics of the Man in the Moon;" with the farther insinuation that the discussion has only involved a "materialistic terminology." The confiding victim is conducted in the

most subtle manner to the brink of the precipice, when his last foot-hold is thus knocked from under him, the epithet of *materialism* snatched away, and he finds himself like a tub that has lost its bottom.

The complaints are apt to be very bitter against all who are indisposed to allow the Materialist his own unmolested way; and even Printers, as we have seen, are forbidden to supply the Critics. Dr. Büchner, in his Preface to the third and fourth Editions of his work on *Force and Matter*, evinces a sad degree of sensibility towards many of his German Critics. Lumping them at last together, he says of them, that—

"Under the protection of rusty traditions, *all who can wield a pen* rival each other in turning their weapons against the theories of the Author and their tendencies; and there is *scarcely any thing printed* in which there is not found some *thundering denunciation* of the presumptuous materialistic philosophy."

This speaks well for Germany, and shows us how a majority of the German Writers have been misapprehended. The fatherland has been darkened by a cloud of small dimensions, but it has obscured the very noon-tide sun. The light which has now been admitted by its scorching rays turns our attention very greatly from that nation to the flood of infidelity which has overspread England, and is beginning to inundate America.

There is one class of society whom Büchner, wiser than the rest, allows a full privilege of opposing his doctrines. He says of them—

"With regard to Parsons and Ecclesiastics, who *never cease* to enlighten and assail us with their eloquence, we beg to repeat that *we can not discuss with them*." "The Author must even submit, being in his immediate vicinity taken to task, commented upon, and *refuted* from the pulpit."

Better still for Germany! Would it were so in America! Of the former nation our Author goes on to say still better things:

"It would be a futile attempt," he exclaims, "on the part of the Author to repel *all attacks* directed *against his person*, and to ward off the whole pack which bark at him from *every printing-office*."

Let us, then, borrow inspiration from ever faithful Germany! Let us take warning from the admissions of its chief offender, as

we thus learn from him how a great Nation, renowned for its learning and science, may be brought into reproach by a very humble few of its restless "Free-thinkers," and the trouble which is also thus inflicted upon others in protecting the ignorant and credulous against their insidious designs. Although the great Poet and Philosopher, Goethe, in his *Comparative Anatomy* (1793), and his *Metamorphosis of Plants and Organic Nature*, and Kant, also, near the close of the last century, promulgated doctrines of progressive development from the most simple to the highest forms of animals and plants, under the influence of external agencies, their doctrines made very little progress in Germany till the advent of Darwinism; while the French Nation are still contented with the organic philosophy of the great Cuvier. Great Britain is far in advance of all the Nations in propagating the worst forms of infidelity—building up new doctrines of Life and spontaneity of living beings upon the platform of "Correlation and Equivalence of Forces," and stretching away into the darkness of Materialism and Pantheism. Its great Philosophers in Theology, Psychology, Physiology—its Paleys, and Bacons, and Stewarts, and Hunters—are consigned to oblivion.

It may be farther said that few writers deny the being of a God *in ipissimis verbis*. Atheism is regarded, like Materialism in relation to the Soul, as a term of reproach, and embarrassing to the doctrine. The propagator of Atheism rather "says in his heart there is no God," and instills his belief into others by only near approaches—such as undermining Revelation—ascribing, at first, all material existences, organic as well as inorganic, to a hypothetical "Unknown Cause," or even employing the term *creator*, and then sliding into the self-existence of all things. Such is *Atheism;* and the same policy applies to *Materialism* as it respects the Soul. But neither terms are epithets. They simply express a fact. Atheism is only equivalent to a disbelief in the Deity, and merely presents the individual as he is. Nevertheless, although there be a disavowal of Atheism, or of Materialism, the whole drift of an Author's work may be in that direction, and conduct its readers into their absurdities. In all such cases a rejection of those terms is important to the interests of the writer, and there are very few who propagate the doctrines that will rest submissively under the imputation. Such was the

case with Professor HUXLEY, when charged with avowing Atheism by the London *Spectator*, 1866, for using the phrases "unknown and unknowable" in their relation to a first cause, in an article in the *Fortnightly Review;* and it is not remarkable that the Duke of Argyll comes to his defense in his work on the *Reign of Law.*

A principal leader in Theoretical Geology, the Rev. President HITCHCOCK, defends Geologists in the following manner, and I quote the defense for their benefit. Thus:

"Even did their views lead to Atheism, it ought not to be insinuated that they are *exactly* Atheists, when, *in fact*, the *greater part of them* are not even Infidels."—*American Bibl. Repository*, Jan. 7, 1837.

Mankind have much the same elements among them now as in the Apostolic days, when they were admonished to "*beware of false prophets which come to you in sheep's clothing; but inwardly they are ravening wolves. Ye shall know them by their fruits.*" There is no other method, therefore, of meeting these influential writers than by an open exposure of their doctrines, so only it be done by presenting in connection their own words. Without this fair as well as plain dealing, neither Religion nor Science can escape the intended innovations. To this, however, they object, an example of which I had occasion to notice in a former work; and as it is applicable to the case before us, at least so far as contumely, and even ridicule, is bestowed upon the Advocates of a Soul and a Principle of Life, as contradistinguishing living beings from lifeless matter, I shall repeat it in a note.*

* Thus it is said by LIEBIG, that—"It is too frequently forgotten by *Physiologists* that their duty really is, not to *refute* the experiments of others, *nor to show that they are erroneous*, but to discover truth, and that alone."

Now this obvious sophistry betrays its motive, since it is utterly at variance with the habits of him who enjoins the fallacy upon others. Truth should be, indeed, the ultimate object of pursuit; but the first and most important step towards its attainment is the removal of obstacles that may lie in its way, and it has grown into a proverb that "it is more difficult to subdue a prejudice than to build a pyramid." Although, therefore, the contemplated method must be sometimes argumentative and controversial, it has the advantage of leading more immediately to a knowledge of the truth upon disputed questions than any other which is not demonstrative. There can be no doubt, indeed, that the "establishment of truth" in Physiology, Psychology, and all Medical Philosophy, can be effected only by a simultaneous refutation of the errors which surround it. The Mind will not surrender a favorite doc-

There can be no fear, however, of denunciations where the cause is either useful or founded in truth, and rarely of the false unless detrimental to some important interest of mankind. But the fear of censure is a common infirmity with Materialists; of which I may add another exemplification in the distinguished savant, Dr. H. BENCE JONES, from his Lectures on "Matter and Force," being the Croonian series for 1868, and in which he says:

"The views which I have endeavored to bring before you *will be at once condemned as materialism* by those who think that they know more of matter than as the fixed abode of force, and more of force than as that which gives energy to matter. Those who are ready to use the word materialism *as a reproach* should remember that they can give no definition of matter which does not involve the definition of force, and that they know nothing whatever of matter except as that which can exert or resist force."

But suppose that we adopt the only possible mode of defining matter and force, matter and Mind, that is, by their manifestations—does our Author see no difference between the phenomena of matter and its inorganic forces and those of Mind? He can not indicate a single coincidence between the former and the latter. The things, therefore, which the phenomena represent are totally unlike each other. And well, indeed, might the Lecturer have had the fear of criticism, if not of "reproach," before him (and even now and then at the hands of those who are informed about "the foundations of natural knowledge"), when he scoffs, in the following manner, at those who place their trust in Revelation as well as in the demonstrations of Science. Here, then, is the denunciation delivered before the best scientific Minds in England, and by whom it may have been applauded:

"The spiritualist who still holds to the *primitive* idea of the perfect separation of matter and force [the Soul] may find full occupation for his reason in weighing the evidence on which his belief or internal conviction rests; but he must leave the investigation of the foundations of *natural knowledge* to those who can see no reason for faith in witches, ghosts, transmutations, and transmigrations. There are some who think little of scientific

trine, however false, to the force of truth alone. Even its practical disasters, as we everywhere witness, are an inadequate demonstration. But when Error and Truth are presented in forcible contrast, it is the pride of Reason to embrace the latter.

truth, but, comparatively speaking, care much to recognize the Almighty Will as the primary cause of all things."

Another instance of the same nature occurs more disinterestedly in the able Review, already mentioned, of Dr. MAUDSLEY'S work on the "Physiology and Pathology of the Mind," where the Reviewer "imagines some will sniff in them [the doctrines] *rank materialism*, and *scout* them as unworthy of discussion." It will be conceded, however, that the present writer is not amenable to the latter charge, although he frankly confesses to the former.

Let us now hear a little more of President HUXLEY'S contributions to Intellectual Philosophy, and to our hope of Immortality:

"Farther," he continues, "I take it to be demonstrable that it is utterly impossible to prove that any thing whatever may not be the effect of a *material and necessary* cause, and that human logic is equally incompetent to prove that any act is really *spontaneous*. A really *spontaneous act* is one which, by the assumption, *has no cause;* and the attempt to prove such a negative as this is, on the very face of the matter, *absurd*. And while it is thus a philosophical impossibility to demonstrate that any given phenomenon is not *the effect of a material* cause, any one who is acquainted with the history of science will admit that its progress has, in all ages, meant, and now more than ever means, the extension of the province of what we call matter and causation, and the concomitant gradual *banishment from all regions of human thought of what we call* SPIRIT *and spontaneity.*"*

Here I stop to say of this brave avowal of *materialism*, that if our Author, the President, will show wherein I have failed, in my "Demonstration of the Soul" (Chap. II.), of proving that an *Originating*, *Self-acting* Principle, known as the Soul, is associated with the brain, he will have obtained a strong ground for his assumption. But he must disprove that demonstration or revoke his "banishment from all regions of human thought of what we call Spirit and spontaneity." Our Author goes on:

"And, as surely as every future grows out of the past and present, so will the physiology of the future gradually *extend the realm of matter and law* until it is co-extensive with knowledge,

* That no misapprehension may arise as to the meaning in which I employ the terms *spontaneous generation* and *spontaneity of being*, see note at p. 85, Chap. VII.

with feeling, and with action. The consciousness of this great truth weighs like a nightmare, I believe, upon many of the best minds of these days. They watch what they conceive to be the *progress of materialism, in such fear and powerless anger as a savage feels when, during an eclipse, the great shadow creeps* OVER THE FACE OF THE SUN [while, according to the testimony of 'Science,' 'the great shadow creeps over the face of the'—EARTH]. The advancing tide of matter threatens *to drown their souls;* the tightening grasp of law impedes their freedom; they are alarmed lest man's moral nature be debased by the increase of his wisdom. If the NEW PHILOSOPHY be worthy of the reprobation with which it is visited, I confess their fears seem to me to be *well founded.* While, on the contrary, could DAVID HUME be consulted, I think he would smile at their perplexities, and chide them for doing even as the heathen, and falling down in terror before the hideous idols their own hands have raised. *What do we know of that* 'SPIRIT' over whose threatened extinction by matter a great lamentation is arising, *like that* which was heard at the death of PAN, *except* that it is also a name for an unknown and *hypothetical* cause, or condition, of states of consciousness?" "With a view to the *progress of Science* [!] the *materialistic* terminology is in every way to be preferred; whereas the alternative or *spiritualistic* terminology is *utterly barren*, and leads to nothing but obscurity and confusion of ideas. Thus there can be no doubt that the farther SCIENCE advances the more extensively and consistently will *all* the phenomena of nature be represented by materialistic formulæ and symbols."

A profession of "*Science*" as the foundation of Materialism is the great bulwark of the Materialistic School; though the sum of the whole is the assumption of the "Correlation of Forces" and "Equivalence of Physical and Vital Forces." Now this so-called "New Philosophy" is as old as the days of MARTINUS SCRIBLERUS; and, indeed, the psychological interpretation to which our Author refers, but under an amusing blunder, is just about the same as his own, and of his entire school. It clearly originated in the satire that was directed against Scriblerus, and has been appropriated by the recent Free-thinkers under the disguise of the "New Philosophy." Indeed, as we have seen, the expedient of the *artificial man*, which was one of the demon-

strations, has been very recently imitated, even to speaking, in behalf of Materialism. (See p. 228.) But we must again have our Author before us, if it be only for the mirth of the thing, in observing how he mixes up the "Free-thinkers" and Martinus Scriblerus in such a way as to make the illustrious Scriblerus both the *defender* and the *denouncer* of Materialism—making him the very *Author* of the letter addressed to himself by the Free-thinkers. Thus, again, our Author:

"And why should 'vitality' hope for a better fate than the other 'itys' which have disappeared since *Martinus Scriblerus accounted for the operations of the meat-jack* by its inherent meat-roasting quality, and scorned the Materialism of those who explained the turning of the spit by a certain mechanism worked by the draught of a chimney?"

The reader is aware that Pope, Swift, and Arbuthnot were the distinguished trio who composed the "Club" that directed its efforts in part against "the arguments of those who consider Thought *as a quality of the molecules of matter*," and gave to the world a forcible and ludicrous parody of that prevailing doctrine in a letter to Scriblerus; purporting to come from the "Free-thinkers." The production of that letter will afford the reader an opportunity of comparing for himself the present with the former philosophy of Materialism, by which he will see that there has been no new phase of the "Science," although designated as the "New Philosophy." Thus:

"*To the learned Inquisitor into Nature*, MARTINUS SCRIBLERUS; *the* SOCIETY OF FREE-THINKERS, *greeting:*

"Grecian Coffee-house, May 7.

"It is with unspeakable joy we have heard of your inquisitive genius, and we think it a great pity that it should not be better employed than in looking after that *theological nonentity* commonly called the SOUL; since, after all your inquiries, it will appear you have lost your labor in seeking the residence of such a chimera, that never had being but in the brains of some dreaming philosophers. Is it not DEMONSTRATION to a person of your sense that, since you *can not find it*, there is no such thing? In order to set so hopeful a genius right in this matter, we have sent you an answer to the ill-grounded sophisms of those crack-

brained fellows, and likewise an easy mechanical explication of Perception and Thinking.

"One of their chief arguments is that *Self-consciousness* can not inhere in any system of matter, because all matter is made up of several distinct beings, which never can make up one individual thinking being.

"This is easily answered by a familiar instance. In every *jack* there is a *meat-roasting* quality, which neither resides in the fly, nor in the weight, nor in any particular wheel of the jack, but is the result of the whole composition; so, in an animal the self-consciousness is not a real quality inherent in one being, any more than meat-roasting in a jack, but the result of several modes or qualities in the same subject. As the fly, the wheel, the chain, the weight, the cords, &c., make one jack, so the several parts of the body make one animal. As Perception, or Consciousness, is said to be inherent in this animal, so is meat-roasting said to be inherent in the jack. As Sensation, Reasoning, Volition, Memory, &c., are the several modes of Thinking, so roasting of beef, roasting of mutton, roasting of pullets, geese, turkeys, &c., are the several modes of meat-roasting. And as the general quality of meat-roasting, with its several modifications as to beef, mutton, pullets, &c., does not inhere in any one part of the jack, *so neither* does Consciousness, with its several modes of Sensation, Intellection, Volition, &c., inhere in any one, but is the result from the mechanical composition of the whole animal.

"Just so the quality or disposition of a *Fiddle* to play tunes, with the several modifications of this *tune-playing* quality in playing of preludes, sarabands, jigs, and gavotts, are as much real qualities in the instrument, as the Thought or the Imagination is in the Mind of the person that composes them; [just as President Huxley says: 'The thoughts to which I am now giving utterance [that is, the Fiddle], and your thoughts regarding them, are the expressions of *molecular changes* in the matter of life, which is the source of all other vital phenomena.']

"It is well known to anatomists that the brain is a congeries of glands, that separate the finer parts of the blood, called animal spirits; that a gland is nothing but a canal of a great length, variously intorted and wound up together. From the arietation

and motion of the spirits in those canals proceed all the different sorts of thoughts.

"We are so much persuaded of the truth of this our hypothesis, that we have employed one of our members, a great virtuoso at Nuremburg, to make a sort of hydraulic engine, in which a chemical liquor resembling blood is driven through elastic channels resembling arteries and veins, by the force of an embolus like the heart, and wrought by a pneumatic machine of the nature of the lungs, with ropes and pulleys, like the nerves, tendons, and muscles; and we are persuaded that this our artificial man will not only walk and speak [the modern one does both], and perform most of the outward actions of animal life, but, being wound up once a week, will, perhaps, reason as well as most of your country Parsons"—or our "modern Philosophers."

In full justice to the cause which I advocate, I shall present Huxley's doctrines, as contained in his work on the "Evidence as to Man's Place in Nature," that the reader may see still farther, not only how destitute are the materialistic assumptions of any foundation, but that they are in perfect conflict with all our knowledge of the composition, structure, functions, laws, and phenomena of Organic Beings, and how they are intended to conduct us into the lowest depths of materialism.

Of Darwin's hypothesis of Development he says—"Mr. Darwin's hypothesis is not, as far as I am aware, *inconsistent with any known biological fact.*" (See Chapter VIII.) "And I, for one, am fully convinced that, if not precisely true, that hypothesis is as near an approximation to the truth as, for example, the Copernican hypothesis was to the true theory of the planetary motions." "But even leaving Mr. Darwin's views aside, the whole analogy of *natural* operations furnishes so *complete and crushing an argument* against the intervention of any but what are termed SECONDARY CAUSES in the production of *all phenomena* of this Universe, that, in view of the intimate relations between man and the rest of the living world, and *between the forces exerted by the latter and all other forces*, I can see no excuse for doubting that *all are co-ordinated terms* of NATURE'S great *progression* FROM THE FORMLESS TO THE FORMED—*from the inorganic to the Organic* —FROM BLIND FORCE TO CONSCIOUS INTELLECT AND WILL."

And such, again, is "Man's Place in Nature," as well as the whole Organic Kingdom; and such, again, the "Evidence."

From what we have now and before seen of Darwin's hypothesis of the "Origin of Species," and as his doctrine inculcates the most insinuating aspect, not only of *Materialism*, but of *Atheism*, I will quote a paragraph from Dr. HOOKER'S late Address before the British Association for the Advancement of Science, of which he was the President in 1868, that my readers may the better understand what are the prospects of the developmental doctrine. Thus Dr. Hooker:

"Reviews on the 'Origin of Species' are still pouring in from the Continent; and AGASSIZ, in one of the Addresses which he issued to his co-laborators on their late voyage to the Amazon, directs their attention to this theory *as a* PRIMARY *object of the expedition* they were then undertaking. I need only add that, of the many eminent Naturalists who have accepted it, not one has been known to abandon it; that it gains adherents steadily; and that it is, *par excellence*, an avowed favorite with the *rising schools* of *Naturalists*." "It is an accepted doctrine with *almost every philosophical Naturalist*, including, it will always be understood, a considerable proportion who are not prepared to admit that it accounts for all that Mr. Darwin assigns to it." "The scientific writers who have publicly rejected the theories of continuous evolution, or of natural selection, or of both, take their stand upon physical grounds, or Metaphysical, or both. Of those who rely on the Metaphysical, their arguments are usually strongly imbued with theological prejudice, and even odium, and as such are beyond the pale of scientific criticism; and I long ago arrived at the conclusion so well put by Agassiz, where he says —'We trust that the time is not distant when it will be universally understood that *the battle of the evidences will have to be fought on the field of Physical Science, and not on that of the Metaphysical.*'" Of this I am persuaded, and therefore avoid the Metaphysical; but this should not interfere with the duties of Theological instruction.

To enforce the foregoing opinions, we are told that—"Ten years have elapsed since the publication of the 'Origin of Species by Natural Selection,' and it has passed through four English editions, two American, two German, two French, several

Russian, a Dutch, and an Italian."—*Norfolk Chronicle*, August 20, 1868.

And thus spoke the Rev. J. M. BERKELEY, President of the Section on Biology, at the same meeting of the Association, on referring to Darwin's "theory of PANGENESIS"—"Like every thing which came from the pen of a writer whom he had no hesitation, as far as his judgment went, in considering as by far the greatest observer of the age, whatever might be thought of his theories when carried out to their extreme results, the subject demanded a careful and impartial consideration. Like the doctrine of 'Natural Selection,' it was sure to modify, more or less, their modes of thought." "Of this, however, he felt assured, that the members of the Association would unite with him *in bidding that great and conscientious Author God-speed.*"—*Norfolk News*, August 21.

And thus DARWIN himself: "I should infer from analogy that probably *all the Organic Beings* which have ever lived on this earth have descended from ONE PRIMORDIAL FORM." That, of course, embraces the human race; but, to remove any obscurities as to the Ancestor of man, it is added that—"In a distant future Light will be thrown on the *Origin* of man and his history."—*Origin of Species*, &c.

Or, as the Rev. Dr. M'COSH expresses it in his "*Typical Forms of Creation*"—"Certain *bi-pedal footsteps* in the new red sandstone of Connecticut are recognized as those of birds. Man, the *true biped*, was to appear in a subsequent and still *distant epoch*."

There is a pleasing novelty about the following doctrine of the "*parturitive powers*" of "Mother Earth," which, moreover, would shape the hypothesis to the Mosaic Narrative as soon as the "parturitive powers had *given birth*" to the first animals and plants. This ingenious doctrine comes to us from Professor TAYLOR LEWIS'S "*Six Days of Creation*" (1855). Thus—

"We are not told that the PARTURITIVE POWERS of the Earth, when they first began to be exercised, were *very different* from what they are now. They may have been more rapid or more slow, but IF *it was* a *real* physical energy, governed by *Law*, and not merely an arbitrary sign of a contra-natural power, it must, at least, have had a harmony in its workings—such a harmony as would have required that the widely varying among its di-

versified effects should bear some ratio to the greater strength or longer duration in the cause. It would not have brought out the full-formed, full-grown, and ripened cedar of Lebanon in the same time it required for *giving birth* to the mushroom. *No intimation is given* that the first growth, after the instantaneous starting power, or the utterance of the creative Word, was not as natural as any that followed. We are rather led to believe that the first growth gave the Law to all subsequent production. *If the first plants or trees did not come from a previous organized seed, the first seeds, at all events, grew out of the plant*, and, as far as the *language* gives us any idea, in a similar manner and by a similar Law, and in a corresponding time, or succession of times, to that which regulated any subsequent seeding, or ripening, or fructification of the parent organism." "There was a *previous nature* in the earth, whether it had been in operation for twenty-four hours or twenty-four thousand years. We may compare this to a stream flowing on and having its regular *current* of Law, or regulated succession of cause and effect. Into this stream we may say there was dropped a *new power—supernatural*, yet not contra-natural, or unnatural—varying the old flow, and raising it to a higher Law and a higher energy, yet still in harmony with it. New causations, or new modifications of causation, arise, and, after the successions and steps required, be they longer or shorter, *a world of vegetation is the result of this chain of causation* in the *one* period; and *animal* creation arose *in another*." "It would be the same *word* repeating, yet expanding, itself in every *ascending species, just as it is* the same specific word repeating itself in every individual birth which *the Laws of maternal nature* are ever bringing out from the seminal energy. [!] What Science may say to this we do not clearly know, nor are we much concerned about her decisions."

But, remarkably enough, our Author pronounces judgment upon others who advocate the development of living beings under the laws of inorganic nature in the following manner:

"The view here advocated as the right interpretation is very different from that eternal and unbroken development which is only another name for the *darkest atheism*."

The following quotation shows, also, very distinctly the disposition which our Author would make of the Narrative of Creation:

"Another *theory* would regard them [animals and plants] as created in numbers, and assigned to their positions in all quarters of the globe, thus constituting a great many centres of production. In both cases the original plants and animals would be *direct* creations, coming immediately from the *ab-extra plastic power*, or mechanical shaping of the Deity. But certainly *the account does not tell of any thing like this. There is no language from which we could infer it.* There is nothing in any other part of the context which would shut us up to it. There are no metaphors which would in any way imply it. *There are no words containing the germs of ideas* which could possibly be expanded so as to embrace such a conception."—*Six Days of Creation.*

CHAPTER X.

MATERIALISTIC DOCTRINES CONTINUED, IN THEIR RELATIONS TO THE SOUL, TO THE ORIGIN OF LIVING BEINGS, AND TO PANTHEISM.—DOCTRINES AND RESPONSIBILITIES OF THEORETICAL GEOLOGY.—HEATHEN PHILOSOPHERS, ETC.—"EMANCIPATION OF SCIENCE FROM THEOLOGY."

NOTHING could have been more auspicious to the success of a general innovation upon established faith in Revelation than the circumstances which attended the introduction of the recent system of Theoretical Geology to the community at large. The press was now becoming an almost universal avenue to knowledge, and that vast class of society which but a little before was shut out from its advantages was ready to receive with avidity whatever would most delight the imagination or administer to the zest for novelty. A spirit of "free inquiry" and "rationalism" was also abroad in the land.

The Rev. Dr. BUCKLAND, the eminent "Canon of Christchurch," constructed his *Bridgewater Treatise on Geology* in the most able manner for these purposes. It bore upon its pages nothing but the extraordinary and the marvellous. It everywhere addressed itself to the imagination, in fact and in rhetorical and pictorial embellishment. It levelled all philosophy that was in the way of its assumptions, classed with the "prejudiced persecutors of Galileo whosoever might apprehend danger to Religion," and went steadily through with the apparently single purpose of overthrowing the Narratives of Creation and the Flood. It had the immense advantage of emanating from one who was commissioned to expound the truths of Revelation, and it bore upon its front the specious declaration that it came to the aid of "Natural Theology." It assumed that its interpretations were as truly founded in nature as the facts themselves, and therefore, says the Author, "No one who believes the Bible to be the word of God *has cause to fear any discrepancy* between

this, his word, and the results of any discoveries respecting the nature of his works." Its claims to consideration were not a little enforced by the astonishing renunciation of that admirable work in proof of the Noachian Flood—the "*Reliquiæ Diluvianæ.*" It enjoyed the patronage of an Association for the promotion of Religion, and had already been crowned by the Savants before it was to receive its greater crown from the hands of the people. Thus armed and thus accomplished, it rode triumphantly over all opposition, and was received with acclamations by the wondering multitude.

Such, then, is in part a brief history of the introduction of popular geology—the creation, as it were, of an instant—the most extraordinary revolution, in view of its consequences, in human affairs. The Christian world being thus prepared, it need not be said who or how many have since basked in its favor; but it may be said that the discoveries which have been subsequently made by the multitude who have entered the field with a view to theoretical problems have resulted in little else than a series of assumptions in conflict with each other, and with Nature and Revelation. Many eminent Divines were at once ingulfed in its vortex; many of them, however, not from deliberate conviction, but from being staggered and alarmed by denunciations of ignorance, bigotry, and intolerance, and by the influence of example and authority. Our Author was not without fear that he would encounter opposition, and he prepares his way by anticipating objections in his second chapter, where he remarks that—"The early and deliberative stages of scientific discovery are always those of perplexity and alarm, and during these stages the human mind is naturally circumspect, and *slow to admit new conclusions* in any department of knowledge. The prejudiced persecutors of Galileo apprehended danger to Religion," &c.

But Theoretical Geology has a long antecedent history when it was limited to the walks of the cultivated ranks; upon whom, however, it wrought those influences which are felt by the unlettered masses when their Superiors are arrayed against Revelation. BUFFON gave a great impulse to ambition in interpreting the Institutions of nature independently of their revealed Creation. From this time speculative views of the origin of the

earth and its inhabitants grew into systems, but of such incongruous parts that new devices quickly succeeded each other, and ultimately became so alarming as to seriously engage the attention of the French Institute, and by which they were unanimously condemned. Cardinal WISEMAN, in his *Lectures on the Connection between Science and Revealed Religion* (1837), refers to the proscribed theories in the following manner:

"From the time of Buffon, system rose beside system like the moving pillars of the desert, advancing in threatening array, but, like them, they were fabrics of sand; and though in 1806 the French Institute counted more than *eighty such theories hostile to the Scripture History, not one of them has stood till now*, or deserves to be recorded."

I have thus quoted the Cardinal partly for the purpose of exemplifying the ambitious and innovating spirit of Theoretical Geology. This eminent Divine had undertaken a work on the "Connection between Science and Revealed Religion." He had an "itching palm," and entered the arena *con amore*. In these popular Lectures he presented a very entertaining system of cosmogony; and, although he built upon a foundation peculiar to himself, his violation of the Sacred Narrative is so great as to have rendered him a special authority in Theoretical Geology for any license in which it may choose to indulge. His avowed ignorance of Geology, like that of the Rev. Dr. Chalmers, Bishop Gleig, and other Clerical Theoretical Geologists, appears, also, to have contributed to his authority. He informs us that—"In making these remarks, I am not guided by a *personal predilection to any system. I have no claim to be called a geologist.* I have studied the science more in its *history* than its practical principles."

HOWARD, the Geologist, in his "History of the Earth and Mankind" (1797), already quoted, has an admirable comment upon the geological systems before they received the judgment of the French Institute; and his criticism is so exactly applicable to the latest in the long series (as I shall have variously shown), that it will be profitable to quote his remarks, particularly as the celebrated "eighty" of the French Institute were similar in their departure from the Mosaic Narrative to the hypotheses of the present day. Howard says of them that—

"These pretended testimonies of Nature are in so much the more doubtful as their adducers disagree among themselves, and that the *jarring systems* hitherto substituted for the Mosaic account, so far from according better with the Laws of Nature, or being a clearer explication of her past and present state, are generally founded on absurd or ideal hypotheses, and often in direct opposition to the most certain principles hitherto deduced from her." (See Chapter VII.)

We now approach the more intimate relations of our subject to Theoretical Geology. But from what we have seen of the prevailing doctrines of the development of living beings, of Materialism in respect to the Soul, &c., we need not be surprised at any hypotheses of the origin and duration of the Earth—whether it have been a part of the Sun in a nebulous condition, and, being detached, have gradually cooled down to the present day, or undergone remodellings through countless millions of years, or whether it be self-existent. The fact, however, of the general admission that man has occupied the globe for only a few thousand years affords, *prima facie*, a substantial ground for the conclusion that the first appearance of plants and animals belongs to the same era; since they must be taken together as inseparable parts in the scheme of Unity of Design. But we have many other reasons for this conclusion, and of a more demonstrative nature.

I had been last speaking of the origin of living beings in the supposed Creative Law of inorganic nature, and we have had the subject under review in a variety of aspects as an abstract speculative question, having mostly for its foundation the assumption of the "Correlation or Equivalence of Physical and Vital Forces." We will now look at the nature of the contributions which it has received from Theoretical Geology.

The doctrine of progressive development manifests itself, as we have seen, in a variety of shapes, depending much upon the peculiarities of individual imagination, and the extent of the disposition to include in the hypothesis any other agency than the forces of the inorganic world. Even where the doctrine takes along a remote connection with creative power, it necessarily inculcates the origin of living beings in the forces of inorganic nature, and leaves nothing to the Creator but that of having or-

dained two systems of Laws in absolute contradiction of each other—one system for the spontaneity, or inorganic production, of living beings, and this to be ultimately supplanted by the sexual system. One of the best examples of this, where the Creator is introduced, is propounded by the distinguished Professor OWEN, and embraces the "typical plan." Thus—

"The recognition of an *ideal exemplar* in the vertebrated animals proves that the knowledge of such a being as man must have existed before man appeared; for the Divine Mind which planned the archetype also *foreknew its modifications.* The archetype idea was manifested in the flesh prior to the existence of those animal species that actually exemplify it. *To what* NATURAL LAWS *or secondary causes the orderly succession and progression of such organic phenomena may have been committed, we are as yet* IGNORANT. But if, without derogation of the Divine Power, we may *conceive* of the existence of *such ministers*, and PERSONIFY them by the term NATURE, we learn from the past history of our globe that it has advanced *with slow and stately steps*, GUIDED BY THE ARCHETYPAL LIGHT AMIDST THE WRECK OF WORLDS, from the first embodiment of the *vertebrate idea* under its old ichthyic vestment, until it *became arrayed* in the *glorious* garb of the human form."—OWEN, on *Limbs.*

Our eminent Author, however, does not adopt the "One Primordial Form," but prefers a multitude of rudiments. This we learn from his "*Anatomy of Vertebrates*" (1868), in which he remarks that—

"I prefer, while indulging in such speculations, to consider the daily homogeneously-developed forms of protozoal jellies, sarcodes, and single-celled organisms, to have been as many *roots* from which the *higher grades* have ramified, than that the origin of the whole organic creation is to be referred, as the Egyptian Priests did that of the Universe, to a SINGLE EGG."

And here is our Author's *only* direct argument in behalf of the "Correlation or Equivalence of Physical and Vital Forces;" and, as will be seen, he reasons in the usual manner, from the phenomena of inorganic matter, which have no relation to the question. Thus he says that—

"Magnetic phenomena are sufficiently wonderful, exemplifying as they do, one of those subtle, interchangeable, may we not

say 'immaterial,' modes of force which endows the metal with the power of attracting, selecting, and making to move a substance extraneous to itself. It is analogically conceivable that the same Cause which has endowed His world with power convertible into magnetic, electric, thermatic, and other forms or modes of force, has also added the conditions of *conversion into the vital mode.*"

Such, again and again, are the supposed forces which give rise to living beings, and such the assumed nature of the premises. The consistency, also, of our Author's opinion of the Soul with the foregoing doctrine may be seen at page 254. I can not, however, avoid an expression of surprise that such sentiments should occur in so magnificent a work as the "Anatomy of Vertebrates," in which our Author displays in the most masterly manner, in the three large copiously illustrated volumes, an almost endless series of wonderful designs, every one of which proclaims the immediate Act of the Creator. Our Author sees a special design even in "*the fitness of the organization of* the Horse and Ass for the needs of mankind;" and "I believe," he adds, "the Horse to have been predestined and prepared for man."—*The designing* power of the *destructive* forces of inorganic nature! What evidence have we that they were ever otherwise than destructive of the conditions of inorganic matter, and therefore, of necessity, utterly incapable of forming organic compounds? Moreover, when they are supposed to have been engaged in the "creation" of animals and plants, they were far more destructive than since the supposed appearance even of man, as attested by those geological debacles which brought about the fossiliferous rocks. But the absurdities of all this I have abundantly examined in the sixth and seventh chapters.

And thus Professor AGASSIZ, in his "*Comparative Physiology*" —"It is evident that there is a manifest *progress in the succession of beings* on the surface of the earth. This progress consists in an increasing similarity to the living fauna, and among the vertebrata, especially, in their increasing resemblance to man. But this connection *is not the consequence of a direct lineage* between the faunas of different ages. There is nothing like parental descent connecting them [nothing like Darwinism]. The fishes of the palæozoic age are in no respect the ancestors of the rep-

tiles of the secondary age, nor *does man descend from the mammalia which preceded him in the tertiary age.* The link by which they are connected is of a higher and immaterial nature; and *their connection is to be sought* IN THE VIEW OF THE CREATOR HIMSELF, whose aim in forming the earth, in allowing it to undergo the successive changes which Geology has pointed out, and in *creating successively all the different types of animals which have passed away*, WAS TO INTRODUCE MAN UPON ITS SURFACE. [!] *Man is the end* towards which *all the animal creation* has tended from the first appearance of the first Palæozoic *Fishes.*"

And what else than spontaneity of living beings (after the manner of the "*Vestiges of Creation*," p. 181), is inferable from the following speculation by HUGH MILLER, whatever reservation there may be, for prudential purposes, in behalf of a Creator? Thus Miller, in his "*Old Red Sandstone:*"

"The line of existence bisects on both sides the line of extinction. May it not probably form a *curve*, descending equally from an elevated centre to the points of bisection on the level of death? But whatever may have been the cause [of increase in the bulk of different species of fish], the change furnishes another instance of analogy between the progress of individuals and of orders." "We begin with an age of dwarfs—we end with an age of giants. The MARCH OF NATURE is an onward and ascending march; *the stages are slow, but the tread is stately;* and to Him who has commanded, and who overlooks it, a thousand years are but a single day, and a single day as a thousand years"—which may be equally said of any indefinite number of years; but it proves nothing.

"Every plant and animal," says the Rev. Dr. M'COSH very truly, in his "*Typical Forms of Creation*" (1856), "is formed after a *general plan*, while it is intended all along by its Maker for a *special end and no other.*" But our learned Author failed of appreciating the import of this greatest of all fundamental truths; for he goes on immediately to say that—"It is only as it [the plan] advances we can discover that end. We are to show that there is a close resemblance between the *foundation structure, or earliest rudiment*, of all plants and animals; we are to show that, *as the structure advances, each takes its peculiar form to suit it to its evidently predetermined end;* and we are to show, at the same

time, that there is a remarkable *parallelism* in the DEVELOPMENT OF ORGANIC BEINGS, and this along the WHOLE SEPARATE LINES OF THEIR PROGRESS." Then why not created at once, as denoted by the "predetermined end," and by the "parallelism?"

And yet our learned Author presents some stubborn facts which are in absolute contradiction of the "typical plan" of spontaneity of beings, fatal to Theoretical Geology, and as conclusive of the Mosaic doctrine of Creation. Thus, among them, we have the following, which is as good as a thousand similar facts, of which, however, we shall have seen a variety:

"In 1847, Professor Plieninger, of Stuttgart, found two fossil molar teeth, which must have belonged to a *warm-blooded quadruped*, lying between the Lias and Keuper formations (approaching the Carboniferous era), in a bone-bed in Würtemberg. Such a relic indicates associations of structure which are found *in man himself;* and at this point in the earth's history we have the HERALD *of the great mammalian class*, at the head of which man is placed —the FIRST in NATURE, though the LAST in time."

The foregoing fact would of itself, were there not many others like it, prove the contemporaneous appearance of man with the most inferior of the animal tribes—those "*exemplars of Nature*" after which man and the superior animals were to be fashioned. And if such exuviæ are not often found in the coal-formations, their existence outside, even at an anterior period, is precisely equivalent. But we shall see why they are rare in the coal-fields. (Appendix III.)

A diversity of opinions exists as to the period of time during which the "Creative Law" of the earth was engaged in its progress from the lowest forms of Organic Life till it was *sufficiently matured* for the production of the human race. A distinguished Professor of Physiology in the University of Heidelberg, H. L. F. HELMHOLTZ, supplies the following information in his Essay on the "*Intervention of Natural Forces*," besides other interesting matter. Thus—

"Different Geologists, proceeding from different premises, have sought to estimate the duration of the CREATIVE PERIOD, and vary from a million to nine million years. And the time during which the *Earth generated organic beings* is again small when we compare it with the ages during which the world was

a ball of fused rocks. For the duration of its cooling from 2000° to 200° centigrade, the experiments of Bishop upon basalt show that about *three hundred and fifty millions of years* would be necessary. And with regard to the time during which the first nebulous mass condensed into our planetary system, our most daring conjectures must cease. (See Appendix I.) The history of man, therefore, is but a short ripple in the ocean of time."

PHILIP HOWARD, who was quite a philosopher in his way, and a reformer withal, proposes, in his "History of the Earth and of Mankind" (quarto, 1797), that the work of Creation shall be attributed "to the well-known Laws of Nature," so that—

"If the progressive formation which Moses describes could be produced by the successive application of those known means in some one order which may be *imagined* and *devised*, the greatest possible weight *will certainly be given to his account of Creation;* and the *real secret* of nature, as far as human understanding can dive, will be nearly *discovered.* Whatever is beyond, that is, *the cause* of these fundamental Laws, must be resolved into the Will of the Creator. The *greatest difficulty will be to* ASCERTAIN *the order and* APPLICATION OF THOSE LAWS. It may probably require the *united study and sagacity of the greatest philosophers* to bring the whole to perfect agreement. It will not be surprising if *the first inquirers commit important mistakes in this research.*"

This vague suggestion has been prolific, as we have seen, of a vast amount of repetition, but of no attempt "to ascertain the order and application of the Laws," so that the subject is left exactly where it was started by our almost forgotten Author—still awaiting "the united study and sagacity of the greatest philosophers." I have said that HOWARD professed to be a reformer, and his account of the state of Theoretical Geology near a century ago is so compact that the reader may readily compare it with the state of the "Science" at our own day; and observe how oblivious he was to his own speculations. Thus—

"Hitherto most Authors who have written upon the subject of Creation seem to have first framed their own system, and then to have endeavored TO STRAIN *the text of Moses to its support, or to explain it away when that could not be effected.* Others have rejected him with slight, *because he stood in the way* of their own

particular ideas. *Few or none have examined candidly* without retrospect to some pre-adopted system."*

Nowhere does Theoretical Geology betray its inconsistencies, or evince less deference to the Wisdom and Consistency of the Creator than in its "typical plan." (See Chapter VII.) Certain species of animals have been dying out to the present day, and their destruction was great and rapid at the early period of the earth, when those violent causes were in operation that brought about its stratification. But this was soon over, as I shall endeavor to show in Appendix I.; and the Dodo is the only authenticated instance of extinction since man began his records. Others, however, like the Mastodon, have not been long extinct. Thus the extinction of animals in ancient times is immediately connected with that of the present through survivors that have come down to us through these by-gone eras. The fact in itself indicates that they are all parts of one, and one only, creation; while it is certainly the only one that is in the least consistent with Unity of Design. It is certain, also, that species, from the lowest to the highest, of the same organization with the extinct and the supposed extinct, continue to exist, having survived the early tempestuous era. But these are assumed to be new developments, without any possible motive for extinguishing all their predecessors, and then reproducing others exactly like them in organic structure, though they be of different species—especially as all the extinct tribes were created *male and female* for their

* Sir CHARLES LYELL summons to the aid of Theoretical Geology, at the outset of his "Principles," the narrative of Creation as embraced in the "*Institutes of Menu*" (B.C. 880), with the particular purpose of showing that—"This pretended revelation was not purely an effort of the unassisted imagination, nor invented without regard to the opinions and observations of naturalists. There are introduced into it certain *astronomical* theories, evidently derived from observation and reasoning." Therefore, says our Author—"If such statements can not be resolved into mere conjectures, we have no right to refer to mere chance the prevailing notion that the *Earth and its inhabitants had formerly undergone a succession of revolutions and catastrophes interrupted by long intervals of tranquillity.*" He then proceeds to surmise that these conclusions may have been deduced from the fossil remains which now underlie Theoretical Geology; notwithstanding it is only till a recent time that they have engaged any attention at all. "They form," says Dr. Buckland, "the *peculiar* feature and basis of Modern Geology." It is, as we have seen of the geological exposition of the distinction in sex, like invoking the aid of the organizing sexual principle in the Creative Law of the Hindoos and Egyptians (page 240).

own perpetuation. But, besides our demonstrative facts (Chapter VII., &c.), what is fatal to Creation by the forces of inorganic nature, and which is sufficient to establish the Mosaic Narrative, is the existence at the present day of the same species whose exuviæ are found in the lowest fossiliferous rocks. This is not only particularly true of the most inferior, those earliest "types" or "exemplars," but of the superior tribes.

I will here quote, however, Theoretical Geology as showing how completely all my conclusions are sustained by its own facts. Take, in the first place, the following comprehensive illustration, in which we find the remote past and the present identified; species dying out while others of an earlier geological date are still among the living, and the climax ended by granting all that can be claimed or desired—that they are "*parts of one great system of Creation.*" And yet what strange contradictions of facts and philosophy are confounded together! The quotation shows us, also, the manner in which Theoretical Geology bridges over the vacuums that have occurred among the living genera of animals. Here is the agreement with us, which should be taken in connection with the fossil mammalian teeth discovered at Würtemberg (p. 325).

"The numerical preponderance of Pachydermata among the *earliest fossil* mammalia, beyond the proportion they bear among *existing* quadrupeds, is a remarkable fact much insisted on by Cuvier, because it supplies from the *relics of a former world* many intermediate forms which do not occur in the present distribution of that important order. As the living genera of the Pachydermata are more widely separated from one another than those of any other order of mammalia, it is important *to fill these vacant intervals with the fossil genera* of a former state of the earth; thus supplying links that appeared deficient in THE GRAND CONTINUOUS CHAIN WHICH CONNECTS ALL PAST AND PRESENT FORMS OF ORGANIC LIFE AS PARTS OF ONE GREAT SYSTEM OF CREATION." —BUCKLAND'S *Bridgewater Treatise.*

Leaving out of the foregoing quotation the assumption of a "*former state of the earth,*" the doctrine is exactly ours; nor will the reader fail of seeing that the assumption is contradicted by the concluding part of the paragraph. But let us suppose that these genera were extinguished according to the hypothesis of

Theoretical Geology; in what aspect does it present the Creator, or the Laws which He ordained, when one or the other brought into being the living genera of Pachydermata? Certainly, that one or the other did it very imperfectly in having left "*vacant intervals to be filled with the fossil genera of a former state of the earth.*" No; the hiatus is occupied by such "*parts of one great symmetrical system of Creation,*" and by such "*links in the great continuous chain,*" that it can not be doubted that the logical mind will come to the conclusion, rather, that those important "links" had "died out a natural death," than that either the Creator or His second cause had assigned them a place in "a former state of the earth," and then have left it to Theoretical Geology to supply the "links" from the rubbish of an exploded world.

Numerous other quotations from the highest Authorities, of a similar import, will be introduced, that all readers may be satisfied by having before them the various facts and conclusions upon our subjects, and that they may see, also, the discrepancies among Geologists upon its fundamental doctrine of creations and extinctions. The two following quotations, from different Authors, are introduced as a farther exemplification of the "typical plan." One of them possesses also the interest of defining the time at which the earth, in its process of cooling down from an incandescent state, became invested with a coating of ice. The reader will remark, also, in respect to the supposed submersion of the north of Europe and North America, that the "erratics" or bowlders now lie everywhere upon the surface of the ground, often with vegetable soil beneath immense masses, or piled up into hills along with a variety of diluvial drift. Thus it is said by a distinguished authority that—

"After the *ice* that carried the *erratics* [our bowlders of the Flood] had melted away, the surface of North America and the north of Europe was covered by the sea, in consequence of *the general subsidence of the continents.* It is not until this period that we find *incontestable traces of the species of animals now existing.* Among the land animals which then made their appearance [after the water had again retreated], there *were representatives of all the genera and species now living around us*, and besides these, many types now extinct, some of them of a gigantic size,

such as the Mastodon, probably the *very last* animal which became extinct *before* the Creation of man."—AGASSIZ'S *Principles of Zoology.*

The animals existing prior to the appearance of man are generally supposed to have become extinct, the last of them being the Mastodon. The present animal tribes then sprang up, preparatory to the approaching advent of the human race. But Theoretical Geology, in the complexities of its hypotheses, as one or another may be suggested by a particular fact, neglects other facts which are absolutely contradictory; as, indeed, we have just seen of the earth being covered with ice (to account for the "erratics"), when it is assumed to have been at least at a tropical temperature in North America and in the north of Europe. The following statement by Sir CHARLES LYELL, among others of a similar nature, will illustrate, in connection with the foregoing, the particular problem in question. Thus—

"The Mammoth also appears to have existed in England when the temperature of our latitudes could not have been very different from that which now prevails; for remains of this animal have been found at North Cliff, in the County of York, in a lacustrine formation, in which *all the land and fresh-water shells can be identified with species and varieties now existing* in that country. Bones of the Bison also, an animal *now inhabiting* a cold or temperate climate, have been found in the same place. That those quadrupeds, and the indigenous species of testacea associated with them, were all *contemporary* inhabitants of Yorkshire, has been established by *unequivocal proof.*"

I, therefore, say that Theoretical Geology should know from its own facts, as they lie obscurely buried in the preceding quotation (which is as conclusive as a thousand of a similar nature), that the contemporaneous existence of aquatic animals now in being, and our own living Bison, along with the extinct Mammoth, proves that there were neither the assumed extinctions nor creations, nor a shade of difference in the condition of the earth during "*the Reign of the Mastodon*" and its present condition.

Here is another statement to the same effect, referring back to the earliest fossiliferous rocks. Thus—

"In the great series of secondary rocks," says Sir Charles, "many distinct assemblages of organized fossils are entombed, all

of unknown species, and many of them referable to genera and families *now most* abundant between the tropics."

The "typical plan" of nature in the production of living beings is the invention of Theoretical Geology, and refers their creation, as we have seen extensively, to the properties or forces that are impressed upon the elements of matter; though, as we have also seen, this doctrine is giving way to Darwin's hypothesis of development from "one primordial form." Should this phase of the spontaneity of living beings prevail, then must Theoretical Geology abandon the entire ground upon which its present fabric is erected. It must substitute a continuous chain from that "one primordial form" for its extinctions, reproductions, and remodellings. But even this is a far more reasonable view of the consistency of the "Laws of Nature" than that aspect of the "typical plan" which represents them as engaged in an experimental work, and extinguishing as they advanced in improvements, till at last, having perfected the plan, and "extinguished the model types," they brought into being, simultaneously, thousands of species organized exactly after the fashion of the extinguished "models," and even reproducing many of the models, and bringing about "the special end" of the whole in the production of man. Or, is there any conceivable purpose for having devoted this earth for millions of years to the animal tribes? Every thing proclaims, and all admit, that the globe and the animal tribes were intended for the special uses of man. Not a motive can be assigned for their introduction until the being for whom they were designed was about to be brought into existence. Throughout the natural world all things conspire together in one universal demonstration that God has created nothing in vain; nor do I believe that there is any intelligent and candid Geologist who will sincerely maintain that animals were created for the mere purpose of enjoyment, or of "reigning the lords of the former world." And how perfectly in harmony is all this with the pronunciations of the Creator—

"And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and *have dominion* over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth."

And I would say of the simultaneous Creation of the several

great parts respectively, of the systematic whole of organic beings, as an able Geologist of the last century apostrophized of that Universe of Orbs which was the work of the Mosaic Days, that—

"I own, in my conception, nothing more magnificent than to imagine all this vast visible universe drawn from nothing, at one and the same time, at God's voice; all those globes, whose magnitudes and whose numbers astonish us, springing forth at once at His command, to take their destined places, to compose diverse systems ruled by invariable laws which there retain them, and to form by their union and reciprocal connection one great whole, whose perfect harmony reason shows us, but whose limits the most exalted imagination can not measure."

And yet the foregoing writer ascribes the origin of living beings to the forces of inorganic nature. And we have seen that while Theoretical Geology borrows its evidence of design from the living kingdoms of nature and bestows them upon the fossils of the rocks, it imputes to the Laws of Nature a fragmentary, experimental system of creation, and without any conceivable object, until it reaches the last animal and plant in that discreditable scheme; and then we are told—"Look, now, at the consummation of Nature's *plan* in the creation of man, and a simultaneous reproduction of a thousand times greater variety in organization than had been the progressive work of an incomprehensible series of ages; see, now, how manifest it is that all this incalculable variety of plants and animals is designed for the well-being of man!" But not a word as to the objects in the production of those races which are supposed to have preceded man's appearance. This is something which Theoretical Geology dismisses as without any apparent design; but, astonished at its own conclusions, apostrophizes after the following manner:

"What various reflections crowd upon the mind if we carry back our thoughts to the time when the surface of the globe was agitated by conflicting elements, or to the succeeding intervals of repose when enormous crocodilian animals scoured the surface of the deep, or darted through the air for their prey; or, again, to the state of the ancient continents, when the deep silence of nature was broken by the bellowings of the Mammoth and the Mastodon, who *stalked the lords of the former world, and perished in*

the last grand revolution that preceded the creation of man. Such speculations are somewhat humbling to human pride, on the one hand; but, on the other, *they prove our superiority* over the rest of the animal creation."!!—Nevertheless, a little farther on, he concludes that—"There is good reason to believe that in North America the age of *Mastodons* was continued to nearly the present epoch, if the animal be not *still living* in some of the unexplored recesses of that vast continent."—BAKEWELL'S *Geology.*

Neglecting for the present the irrefutable demonstration which I have made, particularly in the seventh chapter, of the physical impossibility of organic beings coming into existence through the agencies of the forces and laws of inorganic nature—nay, more, the absurdity of the doctrine, and the certainty that man, and all mammiferous animals, and all birds, must have been created in a state of maturity both of body and mind, it is sufficiently manifest, from other considerations, that the whole "typical plan," or "progressive development" of animals and plants, in an ascending series from the lowest to the highest, must soon disappear from the books; since, as will be seen by our quotations, the exuviæ of the highest order of animals and plants are found with the most inferior in the lowest fossiliferous rocks, while also every variety, from the lowest to the highest, form the present inhabitants of the globe, and many thousand-fold more than the extinct species; and even the supposed extinct species of the lowest organization, with which Theoretical Geology begins its work of development, are from time to time making their appearance upon the theatre of life to the dismay of the "Science." With this geological fabric must also disappear the "remodellings of the earth," to adapt it to its successive creations and as an abode for man. According, also, to Laws in Physiology, which are as well established as any in Astronomy (see Chap. VII.), the physical condition of the earth, in *all its present attributes*, must have been precisely the same as now when those animals and plants whose exuviæ are found in the lowest fossiliferous rocks were in being; since, from their exact analogies in organization to that of the present tribes, precisely the same physical agents were as necessary to those reputedly earliest races as to the present inhabitants.

We have seen that it is a necessary assumption with materialistic writers, in expounding the origin of species, that a special *temporary* change takes place in the forces and laws of inorganic nature once in every few millions of years, for the special generation, or evolution, of new species of animals, and that this change happens very abruptly in the former case, or where the elements of matter organize themselves into animals, or more gradually in the latter case, or where the hypothesis admits of a self-existent "cell" or some other "primordial form." And yet it is a fundamental doctrine with this school, for other purposes, that there has been no change in the forces and laws of nature; and nature bears testimony to its truth.

It is not my purpose here to make any farther demonstration against the foregoing doctrine. But as its disciples abound in all Christendom, I will, in addition, simply say to them that the time when Man is said to have been "evolved from a quadruped" is so completely lost in the mists of the "primeval past," that, if our materialistic Prophets be worthy of trust, the "angel Woman" must soon "evolve" a race of beings as much above mundane angels as she is above the ancestral ape—and that is actually threatened by the Prophets.

The eminent VIRCHOW assures us that—"There was a time when no *blastema* [a formative element of the simple tissues] existed, or could have existed; and when we see that periods arrived in which *the elements combined and became organic forms* [see Chap. VII.], what else can we infer but that *this wonder*, this MOMENTARY manifestation of a LATENT LAW, happened under *unusual conditions?*" And again—"At certain periods of the development of the earth UNUSUAL CONDITIONS existed, under which *the elements* ["carbon, oxygen, hydrogen, and nitrogen," and thirteen others—see page 192] *entering into new combinations*, acquired, *in statu nascente*, vital motions, so that the usual *mechanical conditions were transformed into vital conditions.*"

But all this is changed now. The elements have united, and the work is done. Still, the mature being is just as subject to the "*momentary manifestation of the latent law.*"—"The law of formation," says our Author, "must necessarily be an eternal law, and the causes of its realization can be found only in *a peculiar arrangement of the natural relations.*" Darwin tells us, also,

that it is a law of nature that superior beings shall be evolved from the inferior; and all these Philosophers agree that as new developments go on there is as great an improvement upon the predecessors as man is exalted above the baboon. If this be so, we may look out at any day for a genus of beings intermediate between Man and Angels, probably wearing the wings, and fully endowed with that spiritual faculty of clairvoyance which is already foreshadowed in the remarkable men who have supplied us with this interpretation of the laws of nature. But a very able observer, Professor HELMHOLTZ, of this gifted school, thinks that we are in no immediate danger of such an event; and his opinion is the more reliable from his occupying the chair of PHYSIOLOGY in the University of Heidelberg. Thus, the eminent Professor remarks, in his Essay on "*The Interaction of Natural Forces*," that—

"For a much longer series of years than that during which man has already occupied the world, the existence of the present state of inorganic nature favorable to the duration of man seems to be secured, so that for *ourselves*, and for long generations after us, *we have nothing to fear*. But the same forces of air and water, and of the volcanic interior, which produced former geological revolutions, and buried one series of living forms after another, act still upon the earth's surface. They more probably will bring about the last day of the human race than those distant cosmical alterations of which we have spoken, and perhaps *force us to make way for new and more complete living forms*, as the lizards and the mammoth have given place to us and our fellow-creatures which now exist."—HELMHOLTZ.

We have seen how entirely the Baconian Philosophy is ignored by the "New Philosophy," as well as Bacon's induction of the existence of a Personal Creator, and of a human Soul, from that philosophy; but I shall, nevertheless, present his conclusions upon the questions before us, for the benefit of those who may be hesitating as to "which of the two to choose." Doubtless, Lord Bacon, when speaking of *Atheism*, supplies the true solution of the prevailing propensity among a certain class of scientific men either to discard from their philosophy a Personal God, or to deny the existence of a Soul and a future life, while, as we have seen, both conclusions, whether so intended or

not, are necessarily implied by every developmental doctrine. Thus Bacon:

"This, also, we humbly beg, that human things may not prejudice such as are Divine, neither that, from the unlocking of the gates of sense, and the kindling of a greater natural light, any thing of incredulity or intellectual night may arise in our minds towards Divine mysteries."—"They that deny a God destroy a man's nobility; for certainly man is of kin to the beasts by his body; and if he be not of kin to God by his Spirit, he is a base and ignoble creature." And again he says—"I had rather believe all the fables in the legend, and the Talmud, and the Alcoran, than that this universal frame is without Mind; and, therefore, God never wrought miracles to convince Atheism, because His ordinary works convince it. It is true, *a little philosophy* inclineth man's mind to Atheism, but *depth in philosophy* bringeth men's minds about to Religion; for while the Mind of man looketh upon the *second causes scattered*, it may sometimes *rest in them*, and go no farther; but when it beholdeth *the chain of them confederate, and linked together*, it must needs fly to Providence and Deity. Nay, even that school which is most accused of Atheism doth most demonstrate Religion; that is the school of Leucippus, and Democritus, and Epicurus; for it is a thousand times more credible, that four mutable elements and one immutable fifth essence, *duly and eternally placed*, need no God, than that an army of infinite small portions, or seeds *unplaced*, should have produced this order and beauty without a Divine Marshal."

Or, as Sir Isaac Newton has it—"The growth of new systems out of old ones [or chaos], *without the mediation* of a Divine Power, seems to me apparently absurd." And again he says—"It became Him who created all material things *to set them in order;* and if He did so, it is UNPHILOSOPHICAL to ask for any other origin of this world, or to *pretend* that it might rise out of *Chaos by the mere laws of nature;* though, being once formed, it may continue by those laws."—(*Optics*, Book III.) And this greatest of Philosophers, so devoted to matter, its *forces*, and its laws, was as profoundly convinced of the existence of a self-acting, immortal Soul as he was of its Creator.

But let us look a little farther at the philosophy of this Revealer of the laws of the Universe, interrogate his method of de-

tecting them and the causes of all things; and then place them, along with Bacon's philosophy, in contrast with COMTE'S, and other systems which now predominate in the land to which all future generations will revert with a grateful reverence. Thus, again, the immortal Newton, in his work on *Optics:*

"In the pursuit of truth we must proceed from compounds to ingredients, and *from motions to the forces producing them;* and in general, from *effects to their causes*, and from particular causes to more general ones, till the argument ends in the *most general.* This is the method of analysis. And the synthesis consists in assuming the causes thus discovered and established as principles, and by them explaining the phenomena proceeding from them, and proving the explanations." From these premises he goes on to deduce an Omnipotent Creator as the "most general Cause." "When I wrote my treatise," he says, "about Systems, I had an eye upon such principles as might work with considering men for the belief of Deity." And now mark what he says of the Infidel's philosophy of the creative forces of Nature. We have just seen what he says of the "unphilosophical" notion of supposing that the earth could have been brought into its organized condition by "the mere laws of Nature." That was in part a prospective view of the "nebular hypothesis;" and here is the other part, which supposes that our planetary system was dislocated from the Sun as its circumference cooled down from a gaseous condition to a state of solidity; and also his view of the "Origin of Species." Thus—

"*Such a wonderful uniformity* in the planetary system MUST HAVE BEEN THE EFFECT of choice; and so must the *uniformity* in the bodies of animals. These and their Instincts can be *the effect of nothing else* than the Wisdom and the Skill of a Powerful, Everlasting Agent." (See Appendix I.)

The concerted action which is now in progress in the British School of the "New Philosophy" reveals its prototype as it flourished in Addison's time; and the reader will be interested with the parallel. Referring to the infidelity which then prevailed upon the subject of the Soul and its Immortality, Addison continues thus:

"It is indeed a melancholy reflection to consider that the *British Nation*, which is now at greater height of glory for its coun-

cils and conquests than it ever was before, should distinguish itself by a certain looseness of principles, and a falling off from those schemes of thinking which conduce to the happiness and perfection of human nature. This evil comes upon us from the works of a few solemn Blockheads *that meet together with the zeal and seriousness of Apostles*, extirpate common sense, and propagate infidelity. These are the wretches who, without any show of wit, learning, or reason, *publish their crude conceptions with an ambition of appearing more wise than the rest of mankind, with no other pretense than that of dissenting from them.*" "Cicero, after having mentioned the great heroes of knowledge that recommended the Divine doctrine of the *immortality* of the Soul, calls these small pretenders to wisdom who declared against it certain minute philosophers, using a diminutive even of the word little to express the despicable opinion he had of them. The contempt he throws upon them in another passage is yet more remarkable, where, to show the mean thoughts he entertains of them, he declares he would rather be wrong with Plato than in the right with such company. There is, indeed, nothing in the world so ridiculous as one of these grave philosophical Free-thinkers, that have neither passions nor appetites to gratify, no heats of blood, nor vigor of constitution, that can turn his systems of Infidelity to his advantage, or raise pleasures out of them which are inconsistent with the belief of an hereafter."

Addison also remarks, in the same paper, that—"Several letters which I have lately received give me information that some well-disposed persons have taken offense at my using the word Free-thinker as a term of reproach. To set, therefore, this matter in a clear light, I must declare that no one has a greater veneration than myself for the *Free-thinkers of antiquity*, who acted the same part in those times as the great men of the Reformation did in several nations of Europe, by exerting themselves against the idolatry and superstition of the times in which they lived. It was by this noble impulse that Socrates and his disciples, as well as *all the Philosophers of note in Greece*, and Cicero, Seneca, with *all the learned men of Rome*, endeavored to enlighten their contemporaries amidst the darkness and ignorance in which the world was then sunk and buried. The great points which these Free-thinkers endeavored to establish and inculcate into the

minds of men were, the formation of the Universe, the superintendency of Providence, the perfection of the Divine Nature, the Immortality of the Soul, and the future state of rewards and punishments. On the contrary, the persons who now set up for Free-thinkers are such as endeavor, by a little trash of words and sophistry, to weaken and destroy those very principles, for the vindication of which freedom of thought at first became laudable and heroic. Those apostates from reason and good sense can look at the glorious frame of nature without paying any adoration to Him that raised it; can presume to *censure* the Deity in His ways towards men; *can level mankind with the beasts that perish;* can extinguish in their own minds all the pleasing hopes of a future state, and lull themselves into a stupid security against the terrors of it. If one were to take the *word priest-craft* out of the mouths of those shallow monsters they would be immediately struck dumb. It is by the help of this single term that they endeavor to disappoint the good works of the most learned and venerable order of men, and *harden the hearts of the ignorant against the very light of nature and the common received opinions of mankind.*" "I would fain ask a minute philosopher *what good* he proposes to mankind by the *publishing* of his doctrines? Will they make a man a better citizen; or father of a family a more endearing husband, friend, or son? Will they enlarge his public or private virtues, or correct any of his frailties or vices? What is there either joyful or glorious in such opinions? Do they either refresh or enlarge our thoughts? Do they contribute to the happiness, or raise the dignity of human nature?"

Addison truly says that — "All the philosophers of note in Greece, and all the learned men of Rome, endeavored to establish and inculcate into the minds of men the formation of the Universe, the superintendency of Providence, the perfection of the Divine Nature, the Immortality of the Soul, and the future state of rewards and punishments." In opposition to this we have seen, what will also bear repetition, that the great leader in the "New Philosophy," Dr. Büchner, in his "*Force and Matter*," affirms that—

"We do not boast of having produced *any thing new. Similar ideas* have been promulgated at *all* times, partly by old Greek

and Indian Philosophers; but the necessary empirical basis furnished by *modern Science* was then wanting."!!

Of those ancient heathen Philosophers he produces the authority of only one—old HERACLITUS, surnamed *The Obscure!* whose writings, as we have seen, were lost at an early age. But if the old heathen Infidels be good authority for the "New Philosophy," on account of their antiquity, why not go back a thousand years or more before their day—to such Philosophers as the Author of the Book of Job (B.C. 1500), to David, Isaiah, and that "wisest of men," Solomon? If they did not build upon the foundation of that "modern Science" which corresponds with the divination of Heraclitus, they at least built upon Nature, which the pretended science of the "New Philosophy" should make haste to learn is the only foundation.

Although our Author summons Heraclitus only, he has a sweeping statement which even the exigencies of "the science" can not justify, since the fact is exactly otherwise. Thus—

"The Greeks," he says, "who excelled in many respects, knew only of departed shades; and among the Romans the belief in *Immortality* was very faint."

But let us see who were the leaders of the multitude, and whose writings have come down to us. PLATO, you know, endeavored to prove the existence of the Soul before its union with the body, though very well aware that no physical force existed but in connection with matter. But, as he supposed the Soul to have pre-existed, he thence infers, besides many other arguments to the same effect, that its existence will be perpetuated after it leaves the body. He was also led, by its analogies to Eternal Intelligence, to regard it as an emanation from the Deity.

ARISTOTLE advocated the existence of the Soul; but, like some of our own day, he believed it to be also the principle of Life, and inseparable from the body. His great Arabian "Interpreter" and disciple, AVERROES, an eminent physician of the twelfth century, whose writings are now rendered accessible by Renan, also expounded the philosophy of the Soul. "Would to God," says Keckerman, "that He would raise up a translator to rescue the works of Averroes from the gross ignorance and barbarity of the preceding undertakers, for then we should be sensible of the great services which that Arabian did to philosophy." He was

a native of Cordova, in Spain, where he was high-priest and chief judge; but went to Morocco at the invitation of the King, where he became Professor in the University. His views of the Soul engaged an extensive and profound interest at an early day. There is sometimes an obscurity in his elaborate disquisitions upon the subject which led to very contradictory opinions of his belief. One of his Biographers (1784) remarks that—"He explained Aristotle's doctrine of the unity of the Intellect in such a manner as to overturn the immortality of the Soul, and consequently future rewards and punishments." Bayle refers to several writers who speak of him as wanting in all religion because of his maintaining the *mortality* of the Soul. But it was long since rendered certain that he not only teaches the existence of the Soul, but its immortality. Dr. FRIEND, in his *History of Medicine*, remarks that if Bayle had consulted the writings of Averroes, instead of his commentators, he would have found a very different account of his opinions. In one Dissertation (Phys. Disp. 3) he declares that the Soul is *immaterial*, and in another (Phys. Disp. 4) that it is *immortal*. In a poem written in his old age, he laments the indiscretions of his youth, and then exclaims —"Would to God *I had been born old*, and that in my youth I had been in a state of perfection."*

No one ever entertained more definite and exalted views of the Soul than SOCRATES. He not only traced its existence to an Omnipotent Creator, but distinguished it from all matter as an Essence *per se*, and inferred from its manifestations its alliance to the Divine Mind. He was as fully convinced, also, of its immortality, which he deduced particularly from the analogy between its own designs and those of its Creator. If the Author of the latter be immortal, so must be the former. He had, therefore, no fear of death, but contemplated a future life with joyful emotions, and even anxious to meet his God. He had led a life of holiness, morality, and usefulness. Like Cato and Cyrus, it was

* Averroes says, in the Preface to his medical work, what is worthy the attention of those Physicians who disregard *Principles* in Medicine—"I wrote this work *Colliget*, that is, *universal*, so entitled on account of the order to be observed in this Science, *which descends from universals to particulars*, for in this book I have begun with general rules, and hereafter, with God's assistance, shall undertake another treatise on particulars."

his delight to meditate upon a reunion with his friends in another and happier world. Moreover, he considered Nature, particularly organic, as an absolute proof of its origin in a Designing Intelligence. What a contrast here with our modern "Scientific" Materialists!

When, in his seventieth year, Socrates was about to drink the judicial poison, he was unmoved while his surrounding friends were overpowered with grief, and endeavored to console them by an eloquent apostrophe upon the immortality of the Soul. "It would, indeed," said he, "be inexcusable in me to despise death if I were not persuaded that it will conduct me into the presence of God, the Righteous Governor of the Universe, and into the society of just and good men; but I draw confidence from the hope that something of man remains after death, and that the state of the good will be much better than that of the bad." But it was not alone the surrounding friends who wept at the death of Socrates; for centuries afterwards Cicero remarked, "I never read the story without tears." The piety and the aspirations at immortality of this great Philosopher engage the pen of Addison, who says, in the *Spectator*, that—"On the day of his execution, a little before the draught of poison was brought to him, entertaining his friends with a discourse on the immortality of the Soul, he spoke these words: 'Whether or no God will approve of my actions, I know not; but this I am sure of, that I have at all times made it my endeavor to please Him, and I have a good hope that this my endeavor will be accepted by Him.' I will only add that Erasmus was so much transported with this passage of Socrates, that he could scarce forbear looking upon him as a saint. 'When I reflect,' he says, 'on such a speech, pronounced by such a person, I can scarce forbear crying out, *Sancte Socrates, ora pro nobis.*'—O holy Socrates, pray for us."

Hear the old Heathen also rebuking "Modern Science." Thus he says—"When I was young, it is surprising how earnestly I desired that species of science which they call physical; for it appeared to me pre-eminently excellent in bringing us to know the causes of each phenomenon, through what each is produced, and destroyed, and exists. But happening to hear some one read in a book, which he said was of Anaxagoras, that it is Intelligence which is the Parent of order, and Cause of all

things, I was pleased with THIS CAUSE, and it seemed to me to be well that Intelligence was the Cause of all, and I considered that, were it so, the ordering Intelligence ordered all things, and *placed each thing there where it was best.*"

With the exception of the followers of Epicurus and Demetrius, the schools of Greece taught the existence of the Soul as an Essence distinct from the body, and its immortal and incorruptible nature; and, so far from being infected with *Materialism*, they were generally disposed to reject the doctrine of the resurrection of the *body*, and to believe that the Soul will exist, after its separation, in an abstract condition. Many of them, however, supposed that the Soul would be reunited, after death, with its Creator, and therefore lose its individuality.

In connection with the Grecian philosophy upon the subject before us may be stated that of the Persian, CYRUS, of whom it is said in Scripture—"The Lord stirred up the spirit of Cyrus, and he made proclamation through all his kingdom, and also by writing, saying, Thus saith Cyrus king of Persia, all the kingdoms of the earth hath the Lord God of heaven given me," &c. But Cyrus had no revelation about the Soul, and was as much of a heathen as any of his Grecian contemporaries. But his good sense taught him a sound philosophy upon the subject. XENOPHON tells the story of his belief, from which, also, something may be learned of the spiritual philosophy of the Grecian historian. Cyrus thus—on the prospect of impending death:

"Think not, my dearest children, that when I depart from you I shall be no more; but remember that my Soul (Ψυχὴ), even while I lived among you, was invisible to you; yet *by my actions you were sensible it existed in my body.* Believe it, therefore, existing still, though it be still unseen. How quickly would the honors of illustrious men perish after death if their Souls performed nothing to preserve their fame! For my own part, I could never think that the Soul, while in a mortal body, lives, but when departed out of it dies; or that its consciousness is lost when it is discharged out of an *unconscious habitation.* But when it is freed from all corporeal alliance, *then it truly exists.*"

If we now descend to the best days of Roman times, we shall find that the most enlightened urged the existence and immor-

tality of the Soul—Cicero, Virgil, Cato, &c. Let us have a few examples; and the elder CATO first, who reasoned much after the manner of the elder Cyrus, as already related of the latter. Thus CATO, speaking to Scipio, at the age of more than eighty years, as recorded by Cicero in his treatise on Old Age:

"This is my persuasion, that since the human Soul exerts itself with so much activity; since it has such a remembrance of the past, such a concern for the future; since it is enriched with so many arts, sciences, and discoveries, it is impossible but the being which contains all these must be immortal. No one shall persuade me, Scipio, that your worthy father, or your grandfather Paulus, and Africanus, or Africanus his father, or uncle, or many other excellent men, whom I need not name, performed so many actions to be remembered by posterity without being sensible *that futurity was their right.* And if I may be allowed an old man's privilege, to speak of myself, do you think I would have endured the fatigue of so many wearisome days and nights, both at home and abroad, if I imagined that the same boundary which is set to my life must terminate my glory? Were it not more desirable to have worn out my days in ease and tranquillity, free from labor, and without emulation? But I know not how my Soul has always raised itself, and looked forward on futurity, in this view and expectation, that when it shall depart out of life it shall then live forever; and if this were not true that the Soul is immortal, the Souls of the most worthy would not, above all others, have the strongest impulse to glory. What besides this is the cause that the wisest men die with the greatest equanimity, the ignorant with the greatest concern? Does it not seem that those minds which have the most extensive views foresee they are removing to a happier condition, which those of a narrower sight do not perceive? I, for my part, am transported with the hope of seeing your ancestors, whom I have honored and loved, and am earnestly desirous of meeting not only those excellent persons whom I have known, but those, too, of whom I have heard and read, and of whom I myself have written; nor would I be detained from so pleasing a journey. Oh happy day! when I shall escape from this crowd, this heap of pollution, and be admitted to that Divine assembly of exalted Spirits! When I shall go not only to those

great persons I have named, but to my Cato, my Son, than whom a better man was never born, and whose funeral rites I myself performed, whereas he ought rather to have attended mine; yet has not his Soul deserted me, but, seeming to cast a look on me, is gone to those habitations to which it was sensible I should follow him. And although I may appear to have borne my loss with courage, I was not unaffected with it, but I comforted myself in the assurance that it would not be long before we should meet again, and be divorced no more."

It may be incidentally stated that Cato was ambitious of that fame only which rested upon his labors, and should those fail of his hopes he desired no factitious memorials in the shape of brazen effigies or granite columns. It was proposed to Cato, by a grateful community, that a statue, with a commemorative inscription, should be erected to him; but he replied—"I would rather have it asked why no image has been erected to Cato, than why one has."

And so it was with CICERO, whose profound conviction of the existence and immortality of the Soul, and an immaterial essence, may be readily inferred from his record of Cato's remarks to Scipio and Lælius; but he supplies it in the most unambiguous manner, as in the following quotation:

"If I am wrong in believing that the Souls of men are immortal, I please myself in my mistake; nor while I live will I ever choose that this opinion, wherewith I am so much delighted, should be wrested from me. But if at death I am to be annihilated, as some *minute* philosophers imagine, I am not afraid lest those *wise* men, when extinct too, should laugh at my error." And again he says—"Whatever that Principle is, which lives, perceives, understands, and wills, the same is heavenly and divine, and consequently eternal."

"*Some minute* philosophers." This shows us who the Materialists were in Cicero's time, and how generally the great men embraced the philosophy which reason dictates. But in farther contrast with modern Materialism, which prides itself on Reason, glorifies itself as the reformer of intellectual philosophy, and rejects the light of that Christian Revelation which was so divinely anticipated in the prophetic philosophy of Socrates, and so ar-

dently coveted by Alcibiades,* I may array against it the common instinct of mankind, and will again refer to Cicero for his opinion upon the subject:

"There is, I know not how," says Cicero, "deeply imprinted in the minds of men a certain presage, as it were, of a future existence; and this takes the deepest root, and is most discernible in the greatest geniuses and most elevated minds." And where, I may add, shall we look for a Materialist of intellectual ability who has done honor to his race, or who has not, on the contrary, inflicted the greatest evils upon society? And let us here ponder upon Cicero's parallel between the Soul of man and his Creator, as well as the proof which it presents of the existence of such a Being, and the rebuke which it administers to the Atheist. "What," says Cicero, "can be more flippantly arrogant and unbecoming than for a man to suppose that he has a Mind and Understanding within him, but yet in all the Universe besides there is no such thing? Or, that those things which, with the utmost stretch of his Reason, he can scarce comprehend, should be moved and managed without any Reason at all."

Let us now revert to those primitive days of intellectual darkness, relieved only by the blazing light that has been concentrated and stored away in the Oracles of the Old Testament, beginning with Moses, Job, &c., fifteen hundred years before Christ.

* Addison quotes from Plato a dialogue between Socrates and Alcibiades, in which the former cautions Alcibiades against special supplications in prayer, as they might be granted to his injury. He should, therefore, leave all to the judgment of the God whom he addresses, and should pray after the following manner: "Give us such things as are good for us; whether they are such things as we pray for, or such things as we do not pray for; and remove from us those things which are hurtful, though they are such things as we pray for." On this occasion Socrates also deterred Alcibiades from making a special supplication which he was about to offer, for, if granted, it might result in his injury. "We must, therefore, wait," said Socrates, "till such time as we may learn how we ought to behave ourselves towards God and towards men." "But when will that time come?" said Alcibiades, "and who is it that will instruct us? For I would fain see this man, whoever he is." "It is One," said Socrates, "who takes care of you; but as Homer tells us that Minerva removed the mist from Diomedes's eyes, that he might plainly discover both gods and men, so the darkness that hangs upon your mind must be removed before you are able to discern what is good and what is evil." "Let him remove from my mind," says Alcibiades, "the darkness, and what else he pleases, *I am determined to refuse nothing he shall order me*, whoever he is, so that I may become the better man by it."

If we contemplate with surprise and admiration the opinions of the Greek and Roman Philosophers in respect to a Divine Being and the dignity of the Soul of man, what shall be said of these revealers of the greatest of all fundamental truths, the philosophy to which all things are merely subordinate. If it was but a glimmering of light which sanctified the great minds of Greece and Rome, though far advanced in philosophical inquiries, *whence* came that sublime and harmonious system of Theology which runs throughout the Oracles of the Old Testament, and the commencement of which, in the inimitable Narrative of Creation, dates back to a period "before antiquity began?"

Materialism launches its admonitions against the authorized Expounders of Revelation, should they presume to inculcate the Mosaic Philosophy—nay, the Divine communication of the History of Creation—nay, more, the precepts of Christ in opposition to "science falsely so called." It is said by Dr. HOOKER, in his Address before the British Scientific Association (1868), that—

"A sea of time spreads its waters between that period to which the earliest traditions of our ancestors point, and that far earlier period when man first appeared upon the globe. For his track upon that sea man *vainly questions his spiritual teachers.* Along its hither shore, if not across it, science now offers to pilot him. Each fresh discovery concerning *pre-historic* man is as a pier built on some rock its tide has exposed, and from these piers arches will one day spring, that will carry him farther and farther across its depth." "And if in his track he bears in mind that it is a common object of religion and science to seek to understand the infancy of his existence—that the Laws of Mind are *not yet* relegated to the domain of the teachers of physical science, and that the laws of matter are not within the religious teacher's province, these may then work together in harmony and goodwill. But if they would do this work in harmony, both parties must beware how they fence with that *most dangerous* of all two-edged weapons, NATURAL THEOLOGY—a science *falsely* so called, when, not content with *trustfully* accepting truths hostile to any presumptuous standard it may set up, it seeks to weigh the infinite in the balance of the finite, and *shifts its ground* to meet the requirements of every new fact that science establishes and every old error that science exposes. One of our deepest thinkers, Mr.

HERBERT SPENCER, has said—'If religion and science are to be *reconciled*, the *basis* of the reconciliation must be this deepest, widest, and most certain of facts, that the POWER which the Universe manifests to us IS UTTERLY INSCRUTABLE."

What, then, remains to "the religious teacher" if "the Power is *utterly* inscrutable;" and if he may not "fence" with either Revelation, as presented in the Narrative of Creation, or with Natural Theology, with what "weapons" shall he meet the adversary? Is not the whole subject—Creation, the origin of man, the human Soul, the Author of Inspiration—thus completely "relegated to the domain of the teachers of physical science?"

In some form or other Büchner's sophistry, like the following, is ever reverberated:

"Shall it," says Büchner, "be seriously objected to the application of the sciences to philosophical problems that its results are not agreeable? That the truth is not always agreeable, nor always consolatory, nor always religious, nor always acceptable, is as well known as the old experience of the almost total absence of reward, either external or internal, provided for its disciples." And again—"What this or that man may understand by a governing reason, an absolute power, a universal Soul, a person as God, &c., is *his own affair*. The *Theologians*, with their articles of faith, must be left to themselves [though our Author assails them grossly]; so the *Naturalists with their science;* they both proceed by different routes." And farther—"The same bloody hatred," he says, "with which science was once persecuted by religious fanaticism would revive now, *and with it the Inquisition and auto-da-fé*, and all the horrors with which a refined zealotism has tortured humanity, would be resorted to, to satisfy the wishes of the *Theological Cut-throats*."—He also modestly affirms that—"A man *in advance of his age* beholds the struggle of the contending parties from a high point of view, and sees in the eccentricities of this contest merely the natural and necessary expression of the opposing elements which agitate our time;" and concludes with the truism—"No one can doubt *that truth will finally emerge the victor*." And still again—"It certainly will not be long before the battle becomes general. Is the victory doubtful? The struggle is unequal; the opponents can

not stand against the trenchant arm of physical and *physiological Materialism*, which fights with facts that every one can comprehend, while the opponents fight with suppositions and presumptions."

We have seen abundantly in which quarter the "facts" and the "suppositions and presumptions" lie. But will the Minister of Religion be intimidated by such threats and denunciations as these, while he requires no other weapons than the Bible and "the God of battles?" If, on the contrary, he continues to yield, the day is near when he will be preaching to empty pews. Let him ponder upon VIRCHOW'S declaration that—"*Science and Faith exclude each other.*" "And so we see the men of Theology," says the DUKE OF ARGYLL [*Reign of Law*], "coming out to parley with the men of science—*a white flag in their hands*, and saying—'If you will let us alone, we will do the same by you. Keep to your own province; do not enter ours. The Reign of Law which you proclaim *we admit outside* these walls, but not within them. Let there be peace between us.'—But this will never do. There can be no such treaty dividing the domain of truth. No bargaining, no fencing off the grounds—no form of process will avail to bar this right of way. Blessed right, enforced by blessed power!"

How far the defiant attitude of "Science," and the fear of being "behind the age," may deter the Theological Profession from an interference with the "New Philosophy," remains to be seen. Many of its members in Europe have given in their adhesion, and there are those among them who are entitled to the honor of the Presidency of the British Association for the Advancement of Infidelity.

There are many difficulties with Ministers of Religion as it respects a proper interpretation of the Mosaic Narratives of Creation and the Flood. They are generally uninformed of Geological facts, and of the constitution of Organic Nature as contradistinguished from inorganic; they fear the triumph of Infidelity over Religion unless they countenance the doctrines which Infidelity declares to be "scientific;" and they fear, also, the imputation of ignorance if they repel its teaching, and dislike to be so constantly reminded of the "persecutions of Galileo." It constitutes, therefore, an alarming conjuncture for the present age.

These apprehensions have been often expressed, especially by theological writers upon Geology, of which the following example occurs in the Rev. Dr. J. Pye Smith's "*Relation between the Holy Scriptures and Geological Sciences*" (1839). Thus, referring to the disclosures in Geology which are supposed to indicate a high antiquity of the earth, &c.; and while defending his own course in relation to it, he remarks:

"But can we not throw ourselves into the arms of our brethren in the faith, who, as we have seen, summarily dispose of the whole matter? We can not. First, our own convictions stand in the way. The facts can not be set aside," &c. "Secondly, the body of scientific men in every country would only be *confirmed in their hostility*, and the more *completely discharged from keeping terms with us;* while we should be the men that *laid Christianity under the feet of its adversaries*"—our Author himself co-operating with that "body of scientific men," whom he at the same time regards as "the adversaries of Christianity."

We have already seen how much Christianity has been affected by these concessions, and the sequel will more fully disclose its prospects for a few coming generations. But how unfair the exaction that the Minister of Religion should limit his teachings to Divine Revelation, and leave to an affected "science" its own unmolested way, when that very "science" is sapping Revelation at its threshold, and carrying dismay into those minds which have regarded the Soul and its Immortality as established facts, and not unfrequently with labored effort reasoning God Himself out of existence. Indeed, all defenders of the Narratives of Creation and the Flood are hurled back by Theoretical Geology into "the Dark Ages," even for thinking that there may be some reason to pause before we abandon what are so apparently Divine Revelations, and especially should an attempt be made to show the baseless nature of those speculations which would place our philosophy where it was found by Bacon, and which brought upon Galileo the odium of the Inquisition; and all this, too, when it is conceded by Theoretical Geology that its innovations "startle all our preconceived opinions of the age of our globe, and of the origin of its inhabitants."

It is not the defenders of Revelation who have become the "persecutors of science," or who are in any respect intolerant of

the progress of knowledge. On the contrary, they are the very ones who would protect the Sciences against the corruptions of the "New Philosophy" that is inflicted upon the world in the name of "Science;" and the advocates of that "Philosophy" have ingeniously shifted from themselves upon the disciples of Nature and Revelation the odium of "persecution." "Science," indeed! What kind of science is that which consists alone of a crude assemblage of facts that are daily contradicting themselves, and without a single law or principle that can be predicated of those facts? A "science" which mistakes speculations for principles; while, as I have variously shown, those very speculations are not only contradicted by the established facts and laws of Nature, but are distinguished by remarkable absurdities—particularly in all that relates to the fundamental ground of Theoretical Geology—the "typical plan," the "creation of animals and plants by the forces of inorganic nature," all the "developmental" doctrines. (See, particularly, Chapters VI., VII., and VIII.)

But I am not upon the defensive. I charge Theoretical Geology with that intolerance and that relapse of science and philosophy which it imputes to the defenders of Revelation, and I shall have endeavored to prove it. Does it not also behoove the Minister of Religion, who is not only excluded from the "pale of science," but whose theological labors, whether in the pulpit or through the press, are regarded as worthless—does it not behoove him, I say, to buckle on the armor of Christ more zealously than ever, not only for the sake of mankind, but for his own personal dignity and his aspirations at a life of usefulness that may be perpetuated through the coming generations, when he listens to commendations of HUME'S anathemas by the *President* of the "British Association for the Advancement of Science," Professor HUXLEY, of which the following is one of the examples, in his late celebrated Lecture on the "*Physical Basis of Life.*" Thus he says that—

"HUME'S strong and subtle intellect takes up a great many problems about which we are naturally curious, and shows us that they are essentially questions of *lunar politics*, in their essence incapable of being answered, and therefore not worth the attention of men *who have work to do in the world.* And thus ends one of his Essays—'If we take in hand any volume of Di-

vinity or school metaphysics, for instance, let us ask, *Does it contain any abstract reasoning concerning quantity or number?* No. *Does it contain any experimental reasoning concerning matter of fact and existence?* No. *Commit it, then, to the flames; for it can contain nothing but sophistry and illusion.*' PERMIT ME TO ENFORCE THIS MOST WISE ADVICE."

But I may here remind Professor Huxley of what he conceded when returning thanks to Dr. Hooker, President of the British Scientific Association in 1868, for his Address, in saying that—"There is another reason why I am attached to him, and it is, perhaps, one which many here can understand—both he and I are *sea-faring men*, to whom the smell of salt water and the singing of sea-songs have *a different meaning than to most other people.*"

His election as President of the Association soon followed, notwithstanding his work on "Man's Place in Nature," and his reputation as "the ablest English advocate of Darwin's theory of the Origin of Species." The whole tone of this movement is denoted by the remarks of Professor TYNDALL, on seconding the motion for the vote of thanks, when he said—

"I do believe, if the ranks of science were sought out, investigated, and searched through, and if you wanted two men who would show, in their own persons, an utter forgetfulness of self and devotedness to *the truth* they show they seek and love, you could not find two better examples of self-abnegation and utter self-devotedness than the man who has just spoken, and the man of whom he has just spoken—EDWIN DARWIN and JOSEPH DALTON HOOKER. [Loud cheers."]—*Norfolk Chronicle*, England, August 20, 1868.

It is here worthy of remark that President Huxley, in his Inaugural Address before the British Scientific Association (1870), fulfilled his duty by devoting his Address mainly to a recapitulation of the experiments by which it had been many years ago incontrovertibly settled that the infusoria which appear in stale decoctions of meat are not generated by the forces of nature, but are the products of ova floating in the atmosphere. Having magnanimously repeated to the Association that marvellous demonstration of the "progress of modern science" in its settlement of an obvious fact, he proceeded to announce his own "faith" in *spontaneous generation*, and in the origin of the organic

world, in the following manner, as reported in the London Athenæum:

"Looking back," he said, "through the prodigious vista of the past, I find NO RECORD OF THE COMMENCEMENT OF LIFE, and therefore I am *devoid of any means* of forming a definite conclusion *as to the conditions of its appearance.*" Nevertheless—"If it were given me to look back upon the earth when it was passing through physical and chemical conditions which it can no more see again, I should expect to be a witness of the *evolution of living* protoplasm from *not living* matter. I should expect to see it appear under *forms of great simplicity*, endowed with the power of determining the formation of new protoplasm from such matter as ammonia, carbonates, oxalates and tartrates, water," &c. ["*Three Cheers*," at the conclusion of the Address.]

Here I would again refer the reader particularly to the seventh chapter for a refutation not only of the origin of living beings in the elements of matter through the forces and laws of inorganic nature, as inculcated in the foregoing quotations, and of all the developmental doctrines, but a demonstration of the necessity of the creation of man and animals in a state of maturity.

In an article dated Liverpool, September 23, 1870, and republished in the NEW YORK TRIBUNE of October 15th, occurs the following remark:

"The characteristic of the Liverpool meeting, for 1870, of the British Association for the Advancement of Science, has been that of the *emancipation* of *Science from Theology.* Dr. Hooker was the first President who asserted its independence. But Professor Huxley has acquired a more terrible name, and his elevation to the PRIMACY OF SCIENCE in England was regarded with *consternation.* The *Guardian*, the chief Church of England organ, confesses that it breathes freely *now that Professor Huxley has spoken*, and has pointed no scientific mitrailleuse at the Bishops."

But the drollest thing of all that has issued from "modern science" is the project of promoting its doctrines by *lay-preaching*, notwithstanding its "emancipation from Theology," as lately exemplified in a series of so-called "LAY SERMONS" by the Harlequin of Science. They will doubtless make many converts to the worship of that "*unknowable*" which presides over

the creative forces and laws of inorganic nature, particularly the Sermon on the "Origin of Species." The freshness of novelty pervades all the sermons. This, as in the one just mentioned, is particularly manifest in the manner in which he salutes the Clerical Preachers in another Sermon, of whom he says—"They are at present divisible into three sections—an immense body, who are ignorant and speak out; a small proportion, who know and are silent; and a minute minority, who know and speak according to their knowledge." The merits of their Sermons are measured by the same criterion, as already quoted from our Author on another occasion, and which would "commit them to the flames" (page 352). This opinion of Clerical Sermons is followed by a corresponding suggestion of a novel method of hallowing the Sabbath Day—"Would there," he asks, "really be any thing wrong in using a part of Sunday for the purpose of instructing those who have no other leisure in a knowledge of the phenomena of nature, and of man's relation to nature? I should like to see a Scientific Sunday-school in every parish," &c. What he would inculcate in these Sunday-schools as to "Man's relation to nature" may be inferred from the remark that "I hold with the materialist that the human body is a machine, all the operations of which will, sooner or later, be explained on physical principles; that we shall arrive at *a mechanical equivalent* of consciousness and volition." "And if I say that *thought is a property of matter*, all that I can mean is, that, actually or possibly, the consciousness of extension and the consciousness of resistance accompany all other sorts of consciousness. Why and how they are thus related is an insoluble mystery."

Such are examples of the "Lay Sermons" which our Author would substitute for Clerical Sermons, as avowed particularly in our quotation at page 352.

One of my objects in writing this work is to render my humble aid to the Minister of Religion in enabling him to assume a defiant attitude towards the invader, and lay him prostrate at the vestibule of Science, where he stands, grim-visaged, battering the Temple, on his reckless way to the dark regions of Materialism and Pantheism. The Bible is nowhere opposed to the interests of Science, but the Record of Creation, alone, embraces the foundation of all the Sciences, and defies, as I shall show,

the most rigorous scrutiny. Nor does it fear that one fact can be found in opposition to the plain teachings of Revelation. On the contrary, Nature is an essential part of Religion, and they must be consistent. It is not, therefore, an investigation of Nature to which Religion should object, but that hasty interpretation which arrays Nature in opposition to Revelation without regard to countervailing facts, too impatient to await the progress of discovery. This ground Religion will not surrender, and if it can not sustain itself by the clear and consistent doctrines of the Bible, it should qualify itself to take the field, and fight the battle with the weapons of Science and Philosophy, with those facts which the God of nature has provided for its ultimate triumph. But the qualification is not to be obtained without great labor, and must therefore be limited to a few, and the results delivered over to the multitude. But, above all, do not exclude the Bible from common schools; and, as I write this sentence, there lies before me the report of an Address by the Rev. Dr. PEABODY, Professor in Harvard University, upon the advantages of the Bible in Common Schools, in which he exclaims—"Heaven forbid that we should now take a retrograde step towards barbarism, *from which the Bible alone* has rescued us." Let the Interpreter of Revelation go on expounding the Narratives of Creation and the Flood according to their manifest import; let him go to the Narratives themselves for information, and not to Theoretical Geology, and he will have accomplished much towards the overthrow of materialism, and every thing for Deity. Their literal meaning, as I shall have shown, is contradicted by nothing in Geology, but, on the contrary, is sustained throughout all their details by the soundest principles in Science. It is only a false interpretation of the facts, and "science falsely so called," that lie in the way of that faith which those wonderfully exact and consistent Narratives inculcate—unimpeachable, I say, and show, in a single detail, and each Narrative sustained in all its parts not only by its own internal proof, but by the concurring testimony of all that is known of the constitution and laws of organic and inorganic nature. I say, therefore, let not the Minister of Religion be intimidated by the frowns of the "New Philosophy," nor diverted from his allegiance by any persuasion or admonitory appeals of that "philosophy." Let him rather

listen to the warning of one so thoroughly qualified as the DUKE OF ARGYLL to contrast the Authority of Revelation with the geological speculations upon Nature. In the "Reign of Law," we are admonished that—

"No man who thoroughly accepts a principle in the philosophy of nature which he feels to be inconsistent with a doctrine of Religion *can help having his belief in that doctrine shaken and undermined.*"

And it should be also recollected that the fossils of the rocks, the diluvian bowlders, and other drift, the coal formations, volcanic eruptions, &c., are embraced by "Modern Science" under the "Philosophy of Nature," and that these *accidents* are the foundation of the speculations which Theoretical Geology has designated as a Science, but without a law or principle!

I shall now enter upon the consideration of subjects which have mostly only a relative bearing upon my demonstration of the Soul; and yet such is their nature, they establish the existence of the Divine attribute of man, while their rejection is employed in advancing the interests of Materialism in all its phases —I mean the Narratives of Creation and the Flood. I shall therefore assign this discussion to other chapters, and in part to Appendices.

CHAPTER XI.

NARRATIVES OF CREATION AND THE FLOOD.—THEIR GENERAL BEARING UPON THE DOCTRINES OF MATERIALISM, AND PROGRESSIVE DEVELOPMENT OF LIVING BEINGS.—THEOLOGICAL GEOLOGISTS.—ANTIQUITY OF THE EARTH.—THE TELESCOPE AND THE STARS.

In justice to the cause, both as to the Soul and its Creator, it must be conceded that Theoretical Geology, by means of an accumulation of misapplied facts and a pretended science, has greatly affected the faith of many pious and enlightened Divines in the Mosaic Narrative of Creation, while that of the Flood appears to have been very generally abandoned as a mythological fable, and to the general detriment of religious faith.* The result has

* It appears that a common disbelief in the Noachian Flood had arisen in Europe as early as its renunciation by the Rev. Dr. Buckland, according to the report of M. Boué to the Geological Society of France, in 1834, and which the Rev. President Hitchcock quotes in the following manner:

"'After having thus debated the question of the Deluge and of diluvium, we might believe that *no enlightened man would venture to maintain such reveries.* Nevertheless, such are the *singular notions* that have not ceased to be propagated by well-organized heads in England as well as in France.' Yet M. Boué represents nearly all intelligent men in Europe as having abandoned the idea of a universal deluge. 'The idea of a universal Mosaic or historic deluge,' says he, 'can not be sustained. Such is the opinion of the larger part of the Geologists of the Continent, and the proofs of its absurdity are so evident, that the Lutheran Clergy have long since abandoned it; and lately the English Clergy, the most tenacious of all, have yielded up their arms.' 'As to Germany, a long time ago its Clergy of those communions have wisely abandoned the idle questions.'"—*American Biblical Repository*, January 7, 1837.

But that is not the worst of it; for our distinguished Geologist (President Hitchcock), who has been largely instrumental in giving the present direction to public opinion, both as to the Narrative of Creation and of the Flood, in returning to the latter at a subsequent time, remarks that—

"We freely confess that we can not explain the phenomena *in any other way than by admitting* the occurrence of such a catastrophe. But we have no disposition to be dogmatical on the subject; and we have endeavored to show that *the denial of any such deluge does not bring us at all in collision with the inspired history.*" !!—*Ibid.*, January 7, 1838.

Moreover, Theoretical Geology has so imperiously decided upon an indefinite pro-

been, as we have seen, a common belief in the origin of living beings through the forces of inorganic nature, or some other developmental system, which is not only pantheistic, but totally opposed to the existence of a Soul. The modified doctrine which evades the supposed creative power of the elements of matter, and begins with "protoplasm," or some other "primordial form," has brought in a multitude of adherents; and others have given it their countenance because they have preferred the *assumption* that the laws of nature are endowed with powers capable of evolving new and higher species of animals out of the inferior, when once started on their way out of the "primordial," to the doctrine of successive and distinct formations. They dislike the disjointed typical system; and Theoretical Geology assures them that the *one, consistent, and unchangeable whole* of the Narratives of Creation and the Flood is contradicted by "modern science." But if the reader will consult the opinion of BUFFON, both as to the origin of the Earth and its inhabitants, he will find that "modern science," upon the question before us, has made but very little progress for the last hundred years; while Buffon has the merit of penetrating into the far-distant future.

Theoretical Geology has assumed the right of dictating the proper interpretation of the Narratives of Creation and the Flood; although, in reality, it has no faith in either. Let us have a common example of this. HUGH MILLER, in controverting Dr. Kitto's arguments in favor of the general Deluge, remarks that—

"It may be well not to test too rigidly the value of the remark, meant to be at least of the nature of argument, when we find him saying that—'*A plain man sitting down to read* the Scripture account of the Deluge would have no doubt of its universality!' Perhaps not. But it is at least equally certain that plain men who set themselves to deduce from Scripture the figure of the planet we inhabit had as little doubt, *until corrected by the Geographer*, that the earth was a great plain—not a sphere; that plain men who set themselves to acquire from Scripture some

longation of the Mosaic Days, that it will abandon the Record of Creation sooner than surrender the testimony of the fossiliferous rocks. In speaking of a contingency which is not unlikely to happen, the foregoing Authority declares that—

"Had the remains of man been found among the earliest organic relics, while the Bible represents him as the *last* being created, it would have been difficult to see how the two records could be reconciled."—Rev. Dr. HITCHCOCK's *Elementary Geology*.

notion of the planetary motions had no doubt, in the same way, until corrected by the Astronomer, that it was the earth that rested, and the sun that moved round it; and that plain men who have sought to determine from Scripture the age of the earth have had no doubt, *until corrected by the Geologist*, that it was at most not more than six thousand years old."—*Testimony of the Rocks.*

That is the usual sarcasm, along with the stale comparisons with the "persecutors of Galileo," and the "ignorance and bigotry of the Doctors of Salamanca." In the same way, also, we shall see that Theoretical Geology dismisses every statement in the Narratives of Creation and the Flood, reserving to itself the right of "correcting" our faith in either. It should be said, also, that besides the foregoing misrepresentation of the Scriptures in regard to the form of the earth, Theoretical Geology rejoices in the expression that the "Sun and Moon stood still," and it is a standing position that the Bible is opposed to Science. But the Astronomer himself would employ the same language on a like occasion, and which is quite as scientific as the "rising and setting of the sun," &c. Nor is there any foundation for the assumption that the Scriptures violate Science in teaching that the earth is flat, and that all the heavenly bodies revolve about it. No such doctrines are to be found in the Bible. On the contrary, in the following sublime passage from Isaiah, not only is the spherical form of the earth announced, but, by any fair construction of language, the writer regards the earth as only a point in the midst of apparently endless worlds, and therefore inculcates any thing rather than "a revolution of the heavens about the earth." Indeed, considering how little was known of astronomy, we seem to be reading a communication from the Creator exactly as if revealed to the Prophet. Thus—

"It is He that sitteth upon the *Circle* of the earth, and the inhabitants thereof are as grasshoppers; that stretcheth out the heavens as a curtain, and spreadeth them out as a tent to dwell in." Nor did Science ever produce any thing, in a condensed form, so comprehensive, philosophical, and exactly scientific in all its details, as the Narrative of Creation; which it is my purpose to show in a subsequent chapter.

Although it is not at all an object of the Bible to teach the

sciences, yet, as they are all founded upon Nature, it must be regarded as a Providential circumstance that none of its teachings conflict with Nature, unless clearly miraculous, or obviously metaphorical. But admitting that fallacies in Science may be found in Scripture writings, when their penmen are manifestly speaking without Divine instruction, it would have no bearing whatever upon the events of Creation and the Flood. Such mistakes of the writers, who, it is agreed on all hands, had no scientific purposes in view, would be of no consequence whatever as it respects the intended objects of the Bible. Nor is it of any consequence, so far as Revelation is concerned, whether mankind believe that the earth is round or flat, or turns upon its axis, or is the centre of the Universe. But far otherwise with the Narratives of Creation and the Flood, in which the Almighty speaks *in propria persona.* They are Records of Divine Statements, just as they were delivered, *in ipsissimis verbis*, intended in a literal sense, representing events entirely out of the order of nature, and they are addressed to the faith and common sense of all mankind, and therefore to the understanding of all. Could the Narrative of Creation be absolutely contradicted by geological facts, it would in no respect affect the obvious meaning of any of its statements, nor invalidate the wonderful consistency and harmony of the collective whole, or the Unity of Design by which they are distinguished. It would only prove them to be the most artful fabrications that have ever been invented. And as to the Narrative of the Flood, the only objection worthy of attention that has ever been alleged against it is the supposed want of a sufficient capacity of the Ark. The miraculous nature of the Deluge is beyond the assault of criticism.

Nevertheless, Theoretical Geology has quiet possession of the field; and I have stated some of the expedients, and many analogous examples will have been presented, by which Theoretical Geology has become, by almost common consent, the expounder of the Narratives of Creation and the Flood. I may say, also, that those of the Clerical Profession who attempt to enlighten the public upon the profound subjects which relate to the mechanism and the constitution of the various parts of the globe—its solid contents, its water, its atmosphere, and their individual and collective relations to organic beings, and which can be at all

scientifically discussed only by those who are acquainted with the *whole circle of the sciences*—not only betray an ignorance of the subjects, but generally rely for a superficial information upon those Geologists who have accepted LAPLACE'S avowedly atheistical hypothesis of the evolution of the solar system, and Darwin's assumptions of the origin of species; the last of which, according to President Hooker, in his late Address before the British Association for the Advancement of Science—"is an accepted doctrine with almost every philosophical Naturalist, including, it will always be understood, a considerable proportion who are not prepared to admit that it accounts for all that Mr. Darwin assigns it."*

Of the latter denomination may be ranked, at least inferentially, the late work by the eminent Divine, the Rev. Dr. J. P. THOMPSON, on "*Man in Genesis and in Geology.*" And here I arrive at my purpose of showing the evil that may accrue to society from any approval or toleration by the Minister of Religion

* It is remarkable how little conscious of their own defects in the sciences, especially of Anatomy and Physiology, are some of our ablest and most eminent writers in other departments of knowledge. Here, for example, is an erudite Professor of Chemistry, and of distinguished Authority in Theoretical Geology, who allows the dangers by which it is surrounded, and the necessity of an extensive range of learning for its proper understanding. Thus, Professor SILLIMAN, in his *Appendix* to Bakewell's *Geology:*

"The subject before us (Theoretical Geology) is not one which can be advantageously discussed with the people at large. A wide range of facts, a familiarity with physical science, an extensive course of education, are necessary to the satisfactory exhibition of geological truths, and especially to establish their connection and harmony with the Mosaic History. It is a subject *exclusively for the learned*, or at least for the studious and reflecting; but as regards their own mental furniture, it can be no longer neglected with safety by those whose province it is to illustrate and defend the Sacred Writings."

The Rev. J. PYE SMITH quotes, approvingly, in his *Geology*, another distinguished Theoretical Geologist, the Rev. Professor SEDGWICK, as saying that—

"Book-learning, in whatever degree Authors may be gifted with it, is but a pitiful excuse for writing mischievous nonsense [on Geology]; and that to a Divine or a man of letters *ignorance of the Laws of Nature* and of material phenomena is then only disgraceful when he quits his own ground and pretends to teach philosophy."

And yet neither of these Rev. Authors had any knowledge of the most indispensable, to Theoretical Geology, of the "Laws of Nature"—the laws of Physiology, a proper acquaintance with which gives the fullest assurance that organic beings were originally the direct work of an intelligent, personal, creative Power, and that the animal kingdom was created in a state of maturity both of Mind and body, as I have demonstrated in the seventh chapter.

of doctrines that are in fatal conflict with the best established Revelations of God, however much they may profess to be founded upon "scientific facts;" and I shall confine myself to English and American writers, who may be considered "types of the most accomplished Geological" Theologists. The introduction of such authorities supplies me, also, with opportunities for desirable comment.

The work referred to above bears the date of 1870; but "The matter of the volume," says the Author, "was originally given in a series of Sunday-evening lectures, largely extemporaneous in form, and *purposely popular*, almost colloquial in style." It is said of the *work*, in a Review in the New York DAILY TRIBUNE of October 22, 1869, that—

"Darwinism, to his mind, is not a spectre of infidelity, nor the confirmation of Geology the overthrow of the Bible, nor the 'Antiquity of Man,' if proved, the destruction of Religion." "His treatment of Darwinism is remarkably candid; and he admits that the theory is as consistent with the doctrine of creation by a personal God as any other." "Dr. Thompson wisely takes the ground that the 'Origin of Life' is yet a mystery, and must be referred back to Divine Power." Moreover, the Reviewer says that—"Such is the defective training in the theological schools, that the great implement with which the army of science has won almost all its grand victories in modern progress—the process of scientific reasoning—is an instrument with which the young Theologians are almost utterly unacquainted." "They fight with the ghost of the past, instead of the *bona fide* and TERRIBLE FOES OF THE DAY."

Having thus introduced our Author's work, my object will not be attained without quoting from it rather extensively, as it is, indirectly, in legal phraseology, for "benefit of Clergy," but more immediately for removing a stumbling-block in the way of my demonstration of the *substantive existence of the Soul.* Whoever undertakes this demonstration will act wisely in contributing his aid towards baffling all efforts at undermining our faith in the literal meaning of the Narratives of Creation and the Flood. They are parts of a common whole, manifestly the productions of one Great Mind, and demand a simultaneous corroboration. In the farther execution of my task I shall call to my

aid the most responsible dissentients; but mainly for the purpose of giving to the opponent his best defense.

Going on, therefore, with our Rev. Author—when, speaking for himself, he comes to DARWIN'S defense in the following manner. After remarking in respect to—"The development of one out of another, Mr. Darwin has been misunderstood and somewhat misrepresented," he goes on to say that—

"Darwin teaches *simply* that the variation of species is induced by causes which already existed in the *common progenitor* [or 'primordial form']. Neither does he teach organization by natural causes alone. Divergence by selection, resulting at last in prominent variations of type, he ascribes to natural causes; but the previous question—'*How organic matter began to exist*'—*he does not touch at all.* He says, practically—'*Given* the origin of *organic matter*, my object is to show in consequence of what laws, or what demonstrable properties of organic matter and of its environments, such states of organic Nature as those with which we are acquainted must have come about.'"

The doctrine that evades the question at issue by surmising the creation of some simple form of "organic matter," and then leaving it to its development into organic beings through the agencies of inorganic nature, is, according to the absolute facts of Science (as I have shown extensively in the sixth, seventh, and eighth chapters), as gross an assumption, and as purely atheistical as the doctrine which ascribes the origin of that "organic matter" to a coalescence of *oxygen*, *carbon*, *hydrogen*, and *nitrogen*, and thirteen other elements, through their inherent properties. The former assumption I have shown to be generally a mere pretense, in the hope that the word "created" may secure a more favorable reception. But I speak of the doctrine as inculcated by "modern science," not of individuals who may or may not comprehend its merits. Of the latter class is the Rev. J. PYE SMITH, but to whom his imputation to others may be well applied (and which I shall place in capitals), in the following extract from his work on Geology; where he not only sustains Laplace's nebular hypothesis, but goes even farther than Darwin in his speculations upon the origin of living beings by commencing with *the elements of matter*. Thus our Expounder of Revelation:

"The *Nebular* hypothesis, ridiculed as it has been BY PERSONS

WHOSE IGNORANCE CAN NOT EXCUSE THEIR PRESUMPTION, is regarded as in a very high degree probable by some of the finest and most Christian minds. If I may venture to utter my own impressions, I must profess it as the most reasonable supposition, and the *correlate* of the nebular theory, that God originally gave being to the primordial elements of things, the very small number of simple bodies, endowing each with its own wondrous properties. Then, that *the action of those properties*, in the ways which his wisdom ordained, and which we call laws, *produced*, and is still producing, all the forms and changes of organic and inorganic natures; and that the *series* is by Him destined to proceed, *in combinations and multiplications* EVER NEW, without limit of space or end of duration."!!

What shall be said in justification of thus calling, as it were, upon the Supreme Being to sanction and thus to enforce upon the reader such a tissue of assumptions that are in the most absolute conflict with the admitted facts and laws of nature; as I have variously demonstrated, in respect to organic beings in Chapter VII., and the nebular hypothesis in Appendix I. In regard to the latter (avowedly atheistical by Laplace, its projector), our Rev. Author says, in a note—

"If the reader be not already acquainted with the nature and reasons of this doctrine, he owes himself *a great duty*. Let him consult Prof. Whewell's Bridgewater Treatise, Book II., Chap. VII.; Dr. Mantell's Wonders of Geology, Lect. I., and Prof. Nichol's Architecture of the Heavens."

We may well suppose that such a believer in "modern science" adopts the numerous geological regions of development of animals and plants, which, he says, occurred "perhaps at different and respectively distant epochs."

Nor does the opposition to the Narratives of Creation and the Flood proceed from any want of consideration of its effects upon our faith in Revelation. The Reverend Interpreter last quoted shall supply an example of this. When speaking of the Narrative of the Flood, he says:

"Such are the objections which present themselves against the interpretation which, with grief I acknowledge, is generally admitted, in relation to the Scriptural narrative of the Deluge. It is a painful position in which I stand. I seem to be *taking*

the part of an enemy, adducing materials for skepticism, and doing nothing to remove them. But this situation for me *is inseparable from* THE PLAN of these lectures; the only plan that appeared practicable."

Then why not adopt "a plan" that does not "take the part of an enemy?" Or why deliver the Lectures, or publish the mischievous book?

As to the doctrine of development, the Rev. Dr. THOMPSON thinks, in his work on Geology, that—"Professor OWEN *protests wisely against invoking miraculous power to initiate every distinct species.*" "Owen agrees with Darwin in the theory of development to this extent, that he traces the origin of existing species to extinct species, through the operation of a *secondary cause.*"

That is in conformity with the geological doctrine of successive extinctions and developments, according to the typical plan. But our Reverend Author defends the *distinct creation* of man. How then can he think Owen was "wise" in his protest? If every "distinct species" of animals was not the result of "Miraculous Power," by what logic would it follow that man was an exception? Or, if "existing species of animals owe their origin to extinct species, through the operation of a secondary cause," then certainly man must "be traced" to the same origin. This is demanded as well by anatomical structure and physiological processes as by consistency in the Creator, for the organization and functions are the same in man and all the higher tribes of animals, and one undeviating plan obtains throughout organic nature. And according to the same fundamental rule, if any species of animals or plants were the direct act of a Personal Creator, then was equally so every species. There is no escape from this fundamental ground, and it can not be too constantly before the reader. What, indeed, can be more revolting to Science, or to the Creator's consistency, than the notion that He created a certain number of species, and then delegated the rest to "the operation of a secondary cause!" (See Chapters VII. and VIII.)

Again, our Author says: "It is not the Bible that traces the origin of man back to the monkey or the trilobite—this makes him the child of God, created in his image, for his companionship and his glory."

Nor does the Bible "trace back the origin of the monkey or trilobite," any more than it does man to other species of animals; but it places their origin exactly upon common ground. Why, then, I respectfully ask our distinguished Author, is not the Bible an equally good Authority for a like creation of all organic beings? Is it "wise to invoke miraculous Power to initiate man," the last in the series, and leave the development of the monkey, &c., to "a secondary cause?" The statement as to the creation of animals, and the precise time of their creation, is as explicit as in regard to man. Of birds and aquatic animals it is said that "God created every living thing," &c., and that this was done on the fifth day. On the sixth, "God made the beast of the earth after his kind, and cattle after their kind; and God saw that it was good." Then follows the creation of man on the same day; and if there is any trust to be reposed in the Narrative, are we at liberty to disjoint this one harmonious work of the sixth day, and pervert its exact and coincident statements to clear the way for any chimerical hypothesis that Geology may suggest—so only it will surrender to Religion the "Image of God?" Our Author, however, remarks that—"The writer of the first chapter of Genesis does not give the *processes* of creation, but the succession of phenomena." Is not this, therefore, a very good proof that he had no theoretical views to gratify, and that the "processes of creation" could be alone comprehended by their Author? But suppose the Writer of the Narrative had attempted to describe the *modus operandi* of the Creative Energy, what would Theoretical Geology have then said of the Record? Or, suppose, what is not improbable, and what Theoretical Geology should fear, that the bones of man may be found in the depths of the coal-fields, what then?

I shall hereafter cite our Author's opinion, along with that of other Biblical critics, upon the geological interpretation of the word *Day*, as used in the Narrative of Creation, which has a direct bearing upon the origin of the earth and its inhabitants. We shall then see that he yields, with others, all the latitude Theoretical Geology demands; notwithstanding, he soon after says that—

"We must bear in mind that Geology, one of the newest of sciences, has already *many times* changed its own theories of the

order and method of the structure of our globe." And he goes on to say: "But that order which is now generally accepted by the most accomplished geologists—of whom Guyot, Dana, and Agassiz may be taken as types—is substantially as follows," &c. But we know all about that.

And now our Rev. Author shall entertain us with an exemplification of Laplace's doctrine of the evolution of the Solar System. Thus—

"A beautiful experiment has been invented to illustrate the possible formation of the world from a gaseous condition, according to the nebular theory. In a globe of water and alcohol, mixed in a nicely-proportioned density, is deposited a diminutive ball of *oil*, which, by its relative specific gravity, adjusts itself to the centre of the fluid mass. A certain motion imparted to this by a wire from without gives it the *shape of our globe*, flattened at the poles; another motion will *throw off the moon*, or, if you please, *the four moons of Jupiter;* again, *Saturn* and its rings may be produced by another rotary movement; and finally, the whole mass broken up into globules, *representing the planetary system* as it swims in space."

The reader will doubtless be duly impressed with the force and sublimity of the parallel between the experiment and the supposed evolution from the Sun of our system of planets. It is, at least, an unequalled example of "the sublime to the ridiculous." But, as if in anticipation of the total worthlessness of a theory which he thus encourages, he goes on to say that—"As to the *process*, however, *all is mere conjecture;* Genesis does not describe it, science can not unfold it."

Here our Author supplies, in a Note, a statement of Laplace's "generally accepted" nebular hypothesis, from Prof. Loomis's Treatise on Astronomy. But, instead of repeating that statement here, I shall substitute for it, in the subjoined *Note*, Dr. MEISSNER'S late experiment, by which he evolved, upon a small scale, our entire planetary system, with examples of all the inhabitants, living and extinct; while it exhibits, also, a summary view of the "New Philosophy" of the "Correlation of Vital and and Physical Forces" and of the Supreme Being. The reader will see that it is much more satisfactory than all the hypotheses that have yet appeared—the real *quod erat demonstrandum.* But,

as Tacitus remarks, when speaking of the dress of Orators: "What I am going to say will appear, perhaps, to border on the ridiculous, and excite your mirth. With all my heart; I will hazard it for that very reason." I find the statement in a periodical. If simply a satire, it has a better foundation than the "nebular hypothesis," as that hypothesis would be its foundation. But read the "beautiful experiment."*

* "Dr. Meissner's startling assertion that he has, during the progress of his researches, succeeded in directly producing life in inanimate bodies, has been *denied by no competent authority conversant with the facts in the case.* [The usual argument with Theoretical Geology.] It is somewhat singular that Mr. Crosse's production of the insect known to entomologists as the *acarus Crossii*, by means of electrical currents of extremely low tension, should not have been followed up by *scientific* men more diligently than it has hitherto been; but the general outcry which met the '*Vestiges of Creation*,' in which the explicit account of Mr. Crosse's experiments was first given to the world, may, in part, account for this apparent apathy. It is well known that Sir H. Davy thought that the Principle of Life was a *gas*, and it is now equally well known that the late lamented Professor Faraday, Davy's friend and pupil, was, for several years before his death, in correspondence with Dr. Meissner, of Berlin, in regard to this subject, and had, as now appears, no small share in the honor of the discovery which has been generally claimed for Dr. Meissner. The Memoir in which Dr. Meissner presented his views, and gave an account of his experiments before the Berlin Academy of Sciences, is a great and even touching paper. Great, because of its matter; touching, because it is a history of years of patient study and devotion to an idea.

"His habit of patient thinking has resulted at last in the discovery of the Vital Principle, and the identification of it with motion. The generally received doctrine of the Correlation of Forces by which it has been shown that *heat is but a mode of motion*, and that *thinking is equally* so, has, by Dr. Meissner, been farther illustrated by showing that all life and all the manifestations of life—will, love, the growth of plants and animals—nay, even that God Himself—are but *motion*. Dr. Meissner's God is the great *anima mundi*, but not simply the metaphysical *anima*, but the actual *anima*, which can at will be *extracted* from matter and *produced in the laboratory*. Motion, it will be seen from this, Dr. Meissner claims, is not simply change of place among bodies, but an actual, *tangible substance;* and change of place is but the manifestations of its presence. Sir H. Davy, it will be remembered, claimed that the Life-principle was a *gas*, but Meissner has obtained the gas, and, by means of a powerful apparatus, compressed it into a *solid* form, as was long ago done with carbonic acid gas. As shown by Dr. Meissner to the Academy, during the reading and explication of his Memoir, it was in a hollow glass globe about two feet in diameter, from which the atmospheric air had been, as far as possible, exhausted. Owing to the impossibility of completely withdrawing the air, its manifestations were to some extent impeded. It was in the form of a powder, which, when at rest, is white. But after sufficient air is withdrawn to enable it to assume its activity, the colors of it are those commonly seen in animal and vegetable life. The globe containing this powder was suspended from the wall by a fine silk cord, about five feet from the floor, so that

It will be seen that Dr. Meissner's demonstration shows the deficiency in analogy of the "beautiful experiment" just quoted from the work on *Man in Genesis and in Geology*, and that it no more illustrates Laplace's nebular hypothesis than a pumpkin can enlighten us as to a man's head and brains. But such is ever error in its conflict with Revelation; which leads me to remark farther of that experiment that it reminds us of the parallel between man and the steam-engine, and Professor Faber's "speaking-machine," already mentioned at page 228.

Our Author would reconcile us to the nebular hypothesis, the existing speculations of Theoretical Geology, Darwinism, &c.

"Those," he says, "who hold to the Bible in its integrity as a

it could readily be observed by the members of the Academy. Dr. Meissner, when he wished to call attention to it, removed a black silk cloth by which it was covered, and violently agitated the powder by shaking the globe with great force. When the powder had become chaotic in its forms he allowed the globe to hang quietly from the ceiling, and requested the audience to watch it closely, and see how the microcosm would reproduce, from the earliest times of the Universe, the various changes which the Microcosm has undergone. At first all was confusion, but soon the powder became brilliantly prismatic, and a tremendous motion pervaded the mass. A sudden scintillation of the exterior portions in proximity to the glass succeeded, and a flash of light shot from all these exterior portions towards the centre, representing, as Dr. Meissner said, the cosmical light. At the centre, towards which the light had passed, was then seen, in rapid process of formation, an intensely bright *crystal, the earliest form of organic life*, which was soon to become the central sun of our planetary system. This crystal began to revolve slowly, and, as it was the only portion of the whole which had at all approached to a solid form, the particles of powder began to approach and unite themselves to it. In all directions the effect of attraction was seen, and, like myriads of scintillating comets, the atoms rushed towards their sun, until all had united themselves to it. And now this sun revolved with ever-increasing rapidity, until. as the centrifugal force overcame the centripetal, the ball, in whirling, threw off ring after ring of matter, and, the rings breaking, rolled up into planets, revolving rhythmically around the central sun. Selecting the third planet from the miniature sun, which represented the earth, Dr. Meissner provided the President of the Academy with a powerful magnifying-glass, and requested him to examine the earth. It was in its azoic age. Not a trace of life could be seen on the barren rocks, none in the lonely seas breaking unimpeded on desolate shores. The palæozoic age came on, and the eye could trace sea-weeds and the earliest vegetation; and so the astonished President went through the mesozoic era and onward, as life increased. Vast vegetable forms, mighty ferns, tossing their giant arms in the gale, appeared. Uncouth monsters crept over the land and swam in the seas. Convulsions rent the earth's crust, and hurried millions of animated beings to death. Time passed, and men appeared, digging roots and ranging the forest. Cities arose, and history—the story of human woe—was represented on this mimic world."

revelation from God need not be disturbed by a scientific hypothesis of to-day that *seems* to contradict the letter of the Scriptures. Twenty years may show the hypothesis to be *untenable*, or modify the facts of which it was constructed."

Such, also, was the language of the Rev. Dr. CHALMERS, and of other Theologians who have embarked upon Speculative Geology.

"Those rocks," says Chalmers, "which stand forth in the order of their formation, and are each imprinted with their own peculiar fossil remains, have been termed the *archives* of Nature where she has recorded the changes that have taken place in the history of the globe. They are made to serve the purpose of scrolls or inscriptions, on which we might read of those great *steps and successions* by which the earth has been brought to its present state. And should these archives of nature be but truly deciphered, we are not afraid of their being *openly confronted* with the archives of Revelation. It is unmanly to blink at the approach of light, from whatever quarter of observation it may fall upon us."

Already, since Dr. Chalmers defended the natural length of the Mosaic Days, and admitted, for the special accommodation of Theoretical Geology, an antecedent creation and extinction of animals during the *dark* period of millions of ages that were assumed to have followed the "beginning," and before God said "Let there be light," the whole drama has changed, and the Six Creative Days have been prolonged into those ages that had been allowed to precede the second verse of the Narrative, and which were then held to be sufficient for a field of Speculation. For this new liberty with Revelation the "eyes of the Trilobite" are responsible. But we may well agree with Dr. Chalmers that, whatever may come up in the ways of Geology, it will ultimately "only the more accredit that story which is graven on the Volume of Revelation."

It is a common pretext with those who attempt to reconcile the Narrative of Creation with the speculations of Theoretical Geology, that the progress of discovery will rectify any mistakes, and that the Narration will come out right in the end. Of this there can be little doubt; but what mischief, in the mean time, is desolating society? Who shall repair the evil, or stay its prog-

ress among the masses that have been led astray? Who limit its influence upon the popular faith in the Bible? Why should we not "be disturbed" by hypotheses that have been progressively increasing in their conflict with the Narrative of Creation? Do they yield any encouragement to "those who hold to the Bible *in its integrity* as a revelation from God?" On the contrary, has it not been their tendency to remove from many of the best minds a principal obstacle in the way of Materialism and Atheism? Why has there been, until a recent day, an almost universal concurrence in the literal meaning of the Narratives of Creation and the Flood, unless their statements are unmistakably plain, exact, and harmonious? Or would that construction have been disturbed but for reasons of an extraneous nature?

The Rev. Dr. THOMPSON, when speaking, in his work on Man in Genesis, &c., of the "pile-habitations" in the Lakes of Switzerland, very appropriately cites "the famous maxim of CONFUCIUS, that—'Knowledge consists in knowing what we know, and also in knowing what we do not know.'" Our Author remarks of himself—"I make no pretensions to being a man of science; but as an interpreter of the Bible I am as much beholden to any fact in Science as the most accomplished Scientist." How, then, can he know the proper import of facts that are arrayed in opposition to the plain Narrative of Creation, especially as he concedes that "the facts" upon the questions before us are often giving rise to new theories? Eminent ability to interpret the Bible is no qualification for a knowledge of those facts, but may be employed as a powerful restraint upon the encroachments of Theoretical Geology upon Revelation. And more than all, why should an interpreter of the Bible enter the arena of Theoretical Geology, Darwinism, &c., unless thoroughly qualified by a knowledge of the various sciences to defend the Bible against all comers. Most clearly, infidelity will overrun the masses, and its long train of evils, in the existing state of Theoretical Geology, Darwinism, the Correlation of Vital, Creative, and Physical Forces, &c., unless the Minister of Religion sternly adheres to the unmistakable meaning of the Narrative of Creation.

Nor may I shrink from the duty of referring to a still later popular discourse upon the foregoing subject by the Rev. Dr.

McCosh, one of the eminent Authors of the "*Typical Forms* of *Creation*," and President of Princeton (N. J.) College. This lecture is very briefly reported in the N. Y. Tribune of January 24, 1871; from which the following extracts are derived. Thus—

"THE DARWINIAN THEORY CONSISTENT WITH CHRISTIANITY.

"Dr. McCosh, of Princeton College, delivered last evening, at Dr. Adams's Church, on Madison Avenue, the second of his course of ten popular lectures on 'Natural Theology and Apologetics.' 'In the last lecture,' said he, 'we said that no natural power can produce organized matter out of unorganized matter. But is Religion bound up with a settlement of these scientific questions? Suppose there was proved to be such a thing as *spontaneous generation*, would Religion be overthrown? I think not. There is really no ground for the fears of the timid on the one hand, nor the hopes of the arrogant on the other. *Spontaneous generation*, presuming it to exist, must be a very complicated process. Supposing plants and animals to be formed from germs, how they are propagated is the next inquiry—by special act of creation or by development? And as it is now admitted that Christians may lawfully hold that the earth's strata were not created instantaneously, but by the action of fire and water, why may not the *Christian be allowed to believe in the theory of development*, if sufficient evidence is produced? Development is not so simple a process as some imagine." "The *Darwinian theory* is called the theory of natural selection, but it does not mean that the plant or animal has any power of selection." "As long, however, as leading men of science oppose Darwin, his theory can not be said to be established. I am inclined to think that this theory contains much important truth, but not all the truth, and that it overlooks more than it perceives. On this subject Religion can say it traces all things up to God, whether He has acted by immediate fiat, or through secondary causes.'" (See Chapters VII. and VIII. Also, McCosh on the *Typical Forms of Creation*.)

Theoretical Geology has been at the foundation of all this mischief; and it would seem that just in proportion as the Minister of Religion has yielded to its interpretations of Scripture, so have the Materialists availed themselves of the opportunity, either to

assail his faith in the existence of a Soul, or to baffle his labors in its behalf.

Those of the Clergy who countenance the perversions of the Mosaic Narratives of Creation and the Flood may, for a while, attract the curious, however destitute of religious faith. But curiosity satisfied, or faith undermined, there will be "a beggarly account of empty" pews; and as infidelity pervades the masses, the true pulpit interpreter of Revelation will share in the neglect.

Before entering upon a more critical examination of the Narratives of Creation and the Flood, I shall turn our attention to the supposed evidences of a high antiquity of the human race, as tributary to the developmental and materialistic doctrines, as well as their bearing upon the Mosaic Records.

CHAPTER XII.

THE ANTIQUITY OF MAN IN ITS RELATION TO THE SOUL, AND THE SUPPOSED GRADUAL DEVELOPMENT OF REASON OUT OF THE INSTINCT OF ANIMALS.

THE geological inference as to a prehistoric or pre-Adamite man, and the data upon which it is founded, have an important connection with the materialistic doctrine as to the Soul of man; since it is the direct effect of that supposed high antiquity of the race, if not its direct object, to establish the hypothesis of the evolution of man out of the quadrumanous tribes, and its ablest advocates are earnest propagators of the developmental doctrine. I shall, therefore, present the reader with all the principal facts upon which the hypothesis of a high antiquity is founded.

This subject is alluded to in the following manner by President HOOKER, in his Address before the British Association for the Advancement of Science (1868):

"A NEW SCIENCE has dawned upon us—that is, the *Early History of Mankind.* Prehistoric Archæology (including the origin of language and of art) is the latest to rise of a series of luminaries that have dispelled the mists of ages and replaced time-honored traditions by scientific truths." "It has told us that animal and vegetable life preceded the appearance of man on the globe, not by *days*, but by *myriads of years.*" "And last of all, this new Science proclaims man himself to have inhabited this earth for perhaps many thousands of years before the historic period—a result little expected less than thirty years ago." "Prehistoric Archæology now offers to lead us where man has hitherto not ventured to tread."

Such pretensions of a "New Science," however deficient in interest may be its details, but which professes to be founded upon facts and principles that establish the existence of man "many thousands of years before the historic period," and which assigns his origin to a brutal race, must become the subject of our crit-

ical examination, that no intrenchment of the nature of a "Science" may serve as a retreat for Materialism and Darwinism. Societies of eminent men are formed for the advancement of this "New Science," and the pens of individuals are laboriously employed in magnifying its importance.

Geologists differ in their estimates of the period when the first rudiments of the human Mind began to emerge from the Instinct of animals. Some have assigned the earliest date to 80,000 years B.C.; others to 160,000; and others to 224,000 years. But in the presence of all this, and of the facts upon which it rests, it has been lately affirmed by Dr. PFAFF, in his work on the *Prehistoric Earth* (1868), that there is nothing to show that man has existed upon the earth beyond the Biblical period of 7000 years.*

The Rev. Dr. THOMPSON, however, in his work on *Man in Genesis and in Geology* (1870), supposes that—

"There is *no room to question* the general result of the researches among the river-caves and the diluvial drift; the findings are too numerous and well attested, and the archæological and geological conditions too well ascertained, to *admit a doubt* that Man existed in Europe contemporaneously with the cave-bear, and at least upon the margin of the *glacial age. What, then, shall we make of these facts in view of the Biblical account of the* ORIGIN *of Man?*"

And yet our Rev. Author soon afterwards gives us the following information. Which of the statements should we prefer—the foregoing or the following? Thus—

"After *a careful statement of the discoveries* bearing upon the Antiquity of Man, Dr. Pfaff infers that Man did not appear *till after the ice period.* He declares the *uncertainty of all geological calculations* intended to fix the period of Man's origin, and refutes Lyell's arbitrary estimates from *the present rate of formation in drift and deltas.* He finds no traces of Man, with any certainty, farther back than the great climatic changes of the Quaternary period, 'the most reliable of which do not reach back more than 5000 to 7000 years from the present time.'"

* The calculation of Dr. WILLIAM HALES, in his *Analysis of Ancient Chronology*, will doubtless supersede that of Archbishop Usher, so long accepted. According to the former, our present year (1870) is the 7281st since the Creation, and the 5025th from the Flood.

When Theoretical Geology speaks of a "low antiquity of man," it has no reference to the Biblical account, but to the relation which his vestiges are supposed to bear, in the calendar of time, to those of the vegetable and animal tribes that are entombed in the rocks. Sir CHARLES LYELL supplies, in his *Principles of Geology*, the following example of the usage of Geology in estimating the period of man's existence upon earth:

"I need not dwell," he says, "on the proofs of the *low* antiquity of our species, *for it is not controverted by any experienced Geologist.* Indeed, the real difficulty consists in tracing back the signs of man's existence on the earth to that comparatively modern period when species now his contemporaries began to predominate. It is *never pretended* that our species *coexisted* with the assemblages of animals and plants, of which all, or even a great part, of the species are extinct."

The work by Sir Charles on the *Antiquity of Man* (1863) covers the whole ground relative to this subject, and as the reader will be interested with the principal facts in a narrow compass, I shall now present all those which have any direct bearing upon the question of the existence of a prehistoric or pre-Adamite Man. Those writers whose works have appeared more recently have added nothing to the proof embraced in the work before us, and, indeed, are greatly deficient in the details which are supplied by Sir Charles Lyell. Such, for example, is true of the latest, by Louis Figuier, on Prehistoric Man.

As much will be said in the present chapter of certain vestiges that are supposed to denote the progress of the human Mind at the early periods of our race, it may be well to explain that those relics consist of *stone*, *bronze*, and *iron* implements, and that each is designated as marking an Age of progress, and are known as the "Stone Age," &c.; in that respect corresponding with the method observed in indicating the progress of development among the animal tribes, from the lowest to the highest, by certain Dynasties—as the "Reign of Insects," the "Reign of Saurians," the "Reign of Serpents," the "Reign of the Mastodon," &c. To the foregoing Ages of Man Figuier adds an "Age of Copper" for the North American Indian; but no one has yet thought of an Age of Silver and Gold for the Mexican and Peruvian Indians.

Theoretical Geology has greatly moderated its views as to the high antiquity of the Pile-habitations, and the Stone Age, (the oldest of all,) in Switzerland. Sir Charles, on estimating the "rate of the conversion of water into marshy land" at a certain locality on the Lake of Bienne, supposes that it would require for the aquatic dwelling at Pont de Thiele a period of 6750 years B.C. But this is not a little qualified by his statement that—"The earliest historical account of such habitations is that given by Herodotus of a Thracian Tribe, *who dwelt in the year* 520 B.C. in Prasias, a small mountain-lake of modern Roumelia."

And as to the "Ages," Sir Charles considers M. Morlot's opinion good for "assigning to the Bronze Age (in Switzerland) a date of between 3000 and 4000 years, and to the oldest stone period an age of 5000 to 7000 years."

Nevertheless, there are other vestiges of a similar nature to those in Switzerland, and others of greater significance, that lead Sir Charles to the conclusion that man is of a far higher antiquity. These are embraced in the following quotations:

"The Age of Stone in Denmark coincides with the period of the first vegetation, or that of the Scotch fir, and in part at least with the second vegetation, or that of the oak. But a considerable portion of the oak epoch coincided with the Age of Bronze, for swords and shields of that metal have been taken out of the peat in which oaks abound. The Age of Iron corresponded more nearly with that of the beech-tree." "Hatchets, however, of *copper* have been found in the Danish peat."

One can not fail here of remarking that it would have been more instructive if Sir Charles had given us some other clue to the periods of the fir, the oak, and the beech, than the contemporaneous implements whose ages are referred to those of the trees.

In a cavern at Brixham, England, was found, "in close proximity to a very perfect flint tool, the entire left hind leg of a cave bear," and also the humerus of a cave-bear in another part of the cave, along with the bones of other animals—those of the cave-bear, an extinct species, being the point of interest. From which small circumstance Sir Charles concludes that—

"If they were not all of contemporary date, it is clear, from this case, that the bear had lived after the flint tools were manufactured; or, in other words, that man in this district preceded the

cave-bear." Again, another similar instance—"M. Gaudoy caused a deep excavation to be made, and found nine hatchets, most distinctly *in situ* in the diluvium, associated with the teeth of the *Equus fossilis*, and a species of *Bos*, different from any now living." It is added that, "Mr. Frere had, so long ago as 1797, found flint weapons of the same type as those of Amiens, in a fresh-water formation in Suffolk, in conjunction with elephant remains; and nearly a hundred years earlier (1715) another tool of the same kind had been exhumed from the gravel of London, together with bones of an elephant."

In immediate connection with the foregoing, apparently supposing that his facts may not be very convincing, he brings to their aid the following apothegm, intended for the advancement of "modern science:"

"I may conclude this chapter," he says, "by quoting a saying of Professor Agassiz—that 'Whenever a new and startling fact is brought to light *in science*, people first say, "It is not true," then that "It is contrary to Religion," and lastly, "That every body knew it before."'"

I shall here stop for the purpose of saying, what will be equally applicable to the subsequent statements, that it can not be doubted that most of the phenomena are clearly referable to the agency of currents of water, by which the implements and bones had been transported from different localities and deposited together along with the gravel and alluvium. And all this may have occurred long after the general deluge, or within five hundred or a thousand years before that event. Or, in some of the cases the bones may have been accumulated and buried by the Flood, along with the implements in places where they were manufactured; while in other cases that catastrophe may have left the bones upon the surface, and subsequent torrents of water have conveyed them to their places of final rest. (See Appendices II. and III.) Cities renowned in history have been entombed, and their localities lost to tradition, or ascertained only after laborious explorations—as witness Nineveh and Babylon; and even the very topography of Jerusalem is scarcely a guide to its buried ruins. Caves are visited and dug over, and their contents confounded together, as well by living, as they have been by extinct animals. And who shall say that the human remains were

not more probably carried there by the former than by the latter, or that man may not have sometimes contributed to the coincidence by making the caves his shelter or a burial-place? And as to the relics of the Lakes, they are on common ground with a multitude of other facts that have been misapprehended by seekers after the marvellous, or to sustain some preconceived hypothesis, or perverted with a view to notoriety or the propagation of infidelity. The mounds, fortifications, &c., over an extensive region of North America, which were reared by a large nation that had abandoned the country before the arrival of Europeans, are far greater, because unquestionable, memorials. And yet their preservation and other circumstances denote a period much short of received antiquity. I will add, also, that scarcely had the supposed relics of a pre-Adamite race on the Swiss Lakes been brought within a modern period, than the chalk-flint implements—hatchets, knives, arrow-heads, &c.—found imbedded in certain gravel-drifts of France were associated with the remote geological era of that formation; and this more especially as they occurred in connection with the remains of extinct mammalia. But the question of their high antiquity was subjected to a very logical criticism in Blackwood's Magazine (October, 1860), and conclusively settled in favor of the Mosaic Genealogy, and Theoretical Geology completely routed from its intrenchment.

Indeed, after all, Sir Charles appears to be much of our opinion; for he says—"If we suppose that the greater number of the flint implements occurring in the neighborhood of Abbeville and Amiens were brought by river-action into their present position, we can at once explain why so large a proportion of them are found at considerable depths from the surface, for they would naturally be buried in gravel, and not in fine sediment."

The very depth at which the implements are found, along with the gravel, can leave no doubt of their transportation by water. Our Author has also the following very significant statement:

"It is naturally a matter of no small surprise that, after we have collected many hundred flint implements, including knives, many thousands, *not a single human bone* has yet been met with in the alluvial sand and gravel of the Somme. *This dearth* of the mortal remains of our species *holds true equally, as yet, in all*

other parts of Europe where the *tool-bearing drift* of the post-pliocene period has been investigated in valley deposits. Yet in these *same formations there is no want of bones of mammalia belonging to extinct and living species.*" Our Author, however, is not without hope, for he continues—"That ere long, now that *curiosity* has been so much excited on this subject, *some human remains* will be detected in the older alluvium of European valleys, I confidently expect." But who shall determine the age of that alluvium? Must it be left to the animal exuviæ? Then who shall say when species became extinct? Our Author has the following most unpromising comment upon the foregoing failure of indispensable facts—the human bones for which he was waiting. He says, in immediate connection, that—

"In the mean time, *the absence of all vestige of human bones* which belonged to that population by which so many weapons were designed and executed, affords a most striking and instructive lesson in regard to the value of *negative evidence* when adduced in proof of the *non-existence* of certain classes of terrestrial animals at given periods of the past. It is a new and emphatic illustration of *the extreme imperfection of the Geological record*, of which even they who are constantly working in the field can not form a just conception."

Notwithstanding, however, all this, I shall go on with our Author's evidences of the slow development of the human Mind, since the direct effect of the doctrine is to provide an argument for the hypothesis of evolution, and to discourage a belief in the existence of the Soul, and that the reader may have before him the only proof of any moment that has been offered in behalf of this chimerical pursuit.

The celebrated formation of St. Acheul, near the Somme, supplies our Author with one of his most important evidences of the high antiquity of man, to which there will be a subsequent reference in connection with the Natchez and New Orleans fossil human bones, as indicating the probable time of their entombment. "The terrace of St. Acheul may be described," says our Author, "as a gently sloping ledge of chalk, covered with gravel, topped, as usual, with loam and fine sediment, the surface of the loam being one hundred feet above the Somme. Many stone coffins of the Gallo-Roman period have been dug out of the

upper portion of this alluvial mass." But the important facts are the following: "A fragment of an elephant's tooth was dug out of unstratified sandy loam at eleven feet from the surface; and at seventeen feet from the surface a large and nearly entire unrolled molar tooth of the same species was obtained, belonging to the *Elephas primigenius.* A stone hatchet was discovered at the same time about one foot lower down, in densely compressed gravel." These are the facts, accompanied by observations upon the formation of the valley of the Somme.

The valleys of the Seine supply only scanty and unreliable facts as to man—"In the ancient alluvium of its valleys and its principal tributaries," says our Author, "the same assemblage of fossil animals which have been alluded to as characterizing the gravel of Picardy has been long known." But—"The French geologists have made as yet too little progress *in identifying the age* of the successive deposits of ancient alluvium in various parts of the basin of the Seine, to enable us to speculate with confidence as to the coincidence in date of the granitic gravel with human bones of the Grotte d'Arcy and the stone hatchets buried in the gray diluvium of La Motte Piquet, before mentioned." "In attempting to settle the chronology of fluviatile deposits, it is almost *equally difficult to avail ourselves of the evidence of organic remains and the superposition of the strata*, for we may find two old river-beds on the same level in juxtaposition, one of them perhaps *many thousands* of years posterior to the other."

In the Valley of the Oise—"A flint hatchet, of the old Abbeville and Amiens type, was lately found near Criel, on the Oise, in gravel." "In a higher part of the same valley, near Chauny, a great many fossil bones have been collected." They were of two species of extinct elephants, the musk buffalo, and other mammalia.

As to the basin of the Thames—"Many bones of the elephant, rhinoceros, and hippopotamus have been found in the gravel on which London stands." And—"More than a dozen flint weapons of the Amiens type have already been found in the basin of the Thames; but the *geological position* of no one of them has yet been ascertained with the same accuracy as that of many of the tools dug up in the valley of the Somme, or some other British examples which will presently be mentioned." These examples

consist of "two well-finished [flint] implements in the gravel-pits of Biddenham, thirteen feet from the surface of the soil," where were also found bones of an elephant. In the gravel of Bedford, two miles distant, the remains of another species of elephant, and of a hippopotamus, also occurred. "But," says our Author, "we have scarcely as yet sufficient data to enable us to determine the relative age of these strata." He concludes, however, from the "two implements," that "the country was inhabited by the primitive people who fashioned the flint tools," and that they were "coeval with the extinct mammalia." Numerous flint spear-heads have been discovered at Hoxne, in Suffolk, under clay of the depth of seven or eight feet, and, on account of the number, it is thought "probable that there may have been a manufactory of weapons on the spot." At Icklingham "two flints of a lance-head form have been found in a bed of gravel at the depth of four feet from the surface." The conclusion is that "the tool-bearing gravel here is proved to be newer than the *glacial drift*, by containing pebbles of basalt and other rocks derived from that formation." In a cavern in Somersetshire, supposed to have been an ancient hyena's den, have been found the bones of several extinct species of mammalia. "Intermixed with the above fossil bones were some arrow-heads, made of bone, and many chipped flints, and chipped pieces of chert, which were taken out of the undisturbed matrix, together with a hyena's tooth, showing that man had either been *contemporary* with or *preceded* the extinct fauna."

In South Wales, "in a newly discovered cave, there have been found the remains of two species of rhinoceros [extinct] in an undisturbed deposit, in the lower part of which were some well-shaped flint-knives, evidently of human workmanship. *It is clear*, from their position, that man was coeval with these two species."

In the bottom of a cave in the north of Sicily there is "a bone deposit, and above it other materials reaching to the roof, and evidently washed in from above. In this upper breccia Dr. Falconer discovered flint-knives, bone splinters, bits of charcoal, burnt clay, and other objects indicating human intervention, mingled with teeth of horses and other bones." Dr. Falconer supposed "that the various articles were carried into the cave by the tranquil agency of water."

At what is supposed to have been "a sepulchral vault of the post-pliocene period, near Auvignac, in the south of France"—"Dr. Amiel, the Mayor, ordered all the bones to be taken out and reinterred in the parish cemetery. He ascertained, by counting the homologous bones, that they must have formed parts of no less than seventeen skeletons of both sexes and all ages. He also remarked that the size of the adults was such as to imply *a race of small stature*. Unfortunately, the skulls were injured in the transfer; and, what is worse, after the lapse of eight years, when M. Lartet visited Auvignac, the village sexton was unable to tell him in what exact place the trench was dug where the skeletons were thrown, so that *this rich harvest* of ethnological knowledge seems forever lost to the antiquary and geologist."!! Subsequently, outside and close to the entrance of the vault, M. Lartet "found a layer of ashes and charcoal about seven inches thick, extending over an area of six or seven square yards. Among the cinders were fragments of fossil sandstone reddened by heat." "Among the ashes, and in some overlying earthy layers, were a great variety of bones and implements; among the latter not fewer than a hundred flint articles—knives, projectiles, sling-stones, and chips." "Scattered through the same ashes and earth were the bones of various species of animals." They consisted of nine species of carnivorous, and ten of herbivorous, some of them extinct. Among them was the *Elephas primigenius*, *Rhinoceros tichorhinus*, and the *Ursus spelæus*. "The bones of the herbivora which had contained marrow were invariably split open, as if for its extraction, many of them being also burnt. The spongy parts, moreover, had been eaten and gnawed after they were broken—the work, according to M. Lartet, of hyenas, who were supposed to have prowled about the spot and fed on such relics of the funeral feasts as remained after the retreat of the human visitors."

Such are the material facts of this interesting recital; and, although it is as strong as any of our Author's evidences, he remarks that—"If we accept M. Lartet's interpretation of the ossiferous deposits of Auvignac, both inside and outside the grotto (or cave), they *add nothing to the palæontological evidence* in favor of man's antiquity; for we have seen the same mammalia associated elsewhere with the implements; and species, such as an extinct

elephant and hippopotamus, missing here, have been met with in other places. An argument, however, having an *opposite bearing* may, perhaps, be founded on the phenomena at Auvignac. It may, indeed it has been said, that they imply that some of the *extinct mammalia survived nearly to our own times.* First, because of the *modern style* of the works of art at Auvignac; secondly, because of the *absence* of any signs of change in the physical geography of the country since the cave was used for a place of sepulture."

Our Author now comes to the celebrated fossil man of Denise, found in a volcanic breccia in central France. But this is surrounded by so many doubts and obscurities, and withal, "some geologists," says our Author, "have been disinclined to believe in its *genuineness*," that an adherence to it in behalf of pre-Adamite man only evinces the poverty of geological facts.

Our Author takes up next the human fossil pelvic bone of Natchez, on the Mississippi, which, "accompanied by the bones of the mastodon and megalonyx, is supposed to have been washed out of a more ancient alluvial deposit." This locality was visited by Sir Charles, and the question of the high antiquity of the bone may be dismissed with our Author's statement that—"In my 'Second Visit to America,' in 1846, I suggested, as a possible explanation of this association of a human bone with the remains of a mastodon and megalonyx, that the former may possibly have been derived from the *vegetable soil* at the top of the cliff, whereas the remains of the extinct mammalia were dislodged from a lower position, and *both may have fallen into the same heap* at the bottom of the ravine. On suggesting this hypothesis to Col. Wiley, of Natchez, I found that *the same idea* had already occurred to his mind." Finally, "It is allowable to suspend our judgment as to the *high antiquity* of the fossil." But our Author is not disposed to allow the failure of any discoveries which have been offered as evidences of a pre-Adamite man to affect the validity of other alleged proof that is equally questionable. As in the case of the "ossiferous deposits of Auvignac," he remarks that—"Should future researches confirm the opinion that the Natchez man coexisted with the mastodon, it would not enhance the value of the *geological evidence* in favor of *man's antiquity.*"

About the year 1850, a fossil human skeleton was discovered

in the Mississippi delta near New Orleans, which has been a great trophy for "the science." It was found "at the depth of sixteen feet from the surface, beneath four buried forests superimposed upon each other." From some special calculations a distinguished geologist quickly referred the catastrophe which buried the individual to the year 160,000 before the reputed creation of Adam. Dr. Dowler, however, the discoverer, estimated the period at fifty thousand years. But it will probably be concluded, from the want of other evidences of the existence of man on this continent for two thousand years, as well as from other facts, that the man, who had the characteristic skull of the red Indian, and therefore later than the tribes who have left their vestiges of mounds and tumuli, was imbedded within a comparatively recent date by flood-wood brought down by the freshets of the Mississippi River.

Sir Charles alludes to the foregoing New Orleans fossil man in connection with the Natchez specimen, and dismisses it in the following manner: "In that case no remains [animal] were found associated with those of man." At an early part of his work he had referred to this fossil, remarking that—"As the discovery had not been made when I saw the excavation in progress in 1846, I can not form an opinion as to the value of the chronological calculations which have led Dr. Dowler to ascribe to this skeleton an antiquity of 50,000 years."

In connection with the foregoing our Author has an estimate of the time during which the delta of the Mississippi was in progress of formation, in which, near New Orleans, the fossil skeleton was found, and remarks that—"The lowest estimate of the time required would lead us to assign a high antiquity, amounting to many tens of thousands of years, probably more than 100,000, to the existing delta."

We may now "form an opinion as to the value of the chronological calculations" which have led our Author to ascribe to the formation of the delta a period of 100,000 years, and also of many other things in Theoretical Geology, by comparing the estimate with another statement in his Principles of Geology relative to a region in near proximity with the delta of the Mississippi. Thus our Author:

"So late as the year 1812, the whole valley, from the mouth

of the Ohio to that of the St. Francis, including a tract of 300 miles in length, and exceeding in area the whole basin of the Thames, was convulsed to such a degree as to create new islands in the river, and lakes in the alluvial plain, some of which are twenty miles in extent." But this is only an example of the effects of earthquakes in substituting geological problems for others of a very different import. "It is scarcely necessary," says Sir Charles, "to observe that the inequalities produced even by one shock might render the study of the alluvial plain of the Mississippi, at some future period, most perplexing to a geologist who should reason on *the distribution of transported materials* without being aware that the configuration of the country had varied materially during the time when the excavating or removing power of the river was greatest."

It should be said, also, that the calculations made by Sir Charles as to the time occupied in the formation of deltas, and other similar deposits, have been the subject of critical examination, and shown to be erroneous, and that the formations are of no very remote period.

Returning to our Author's work on the "Antiquity of Man," we have arrived at his opinion of the era of him who made the hatchet that was found in the terrace of St. Acheul (page 380). "If," says Sir Charles, "I was right in calculating that the present delta of the Mississippi has required, as a minimum of time, more than 100,000 years for its growth, it would follow, if the claims of the Natchez man to have coexisted with the mastodon are admitted, that North America was peopled more than 100,000 years ago by the human race. But even were that true, we could not presume, reasoning from ascertained geological data, that the Natchez bone was *anterior in date to the antique hatchet* of St. Acheul."

Next follows an account of the "Forest Bed" in the Norfolk Cliffs, in the vicinity of Cromer, which will throw some light upon the supposed high antiquity of the foregoing deposits. At this "bed" occurs a buried forest, between the stumps of which and the lignite above them are found no less than eleven species of well-known living plants—namely, the *Scotch fir*, *spruce fir*, *yew*, common *sloe*, *buck bean*, *white water-lily*, *hornwort*, *yellow water-lily*, *pond-weed*, *alder*, and *oak*. There are also imbedded the

exuviæ of several species of living insects and fresh-water shells. In the midst have been found, also, the bones of several *extinct* mammalia.

This is a hard case for Theoretical Geology—its extinctions, progressive developments, &c.—and thoroughly disproves the conclusions that have been derived from the association in gravel drift and alluvium of fossil human bones and flint implements with the bones of extinct elephants, &c. It was, however, too important a case to have been neglected by our Author, and not to have exacted from him a candid admission of its crushing import. He apostrophizes thus over its unwelcome tidings—

"When we consider the *familiar aspect of the flora, the accompanying mammalia are certainly* MOST EXTRAORDINARY. There are no less than two Elephants, a Rhinoceros, and Hippopotamus [all extinct], a large extinct Beaver, and several large estuarian and marine Mammalia, such as the Walrus, the Narwhal, and the Whale"—phenomena that are readily and only explained by the Noachian Flood and subsequent currents of water. (See Appendix III.) Our Author, however, enters into speculations about glacial drift as tributary to the formation of the cliff, and concludes the chapter with the remark that—

"We *need not despair* of one day meeting with the signs of man's existence in the forest bed, or in the overlying strata, on the ground of any *incongeniality of the climate*, or incongruity in the state of the animate creation with the well-being of our species."

But should such a discovery be made, what would it prove in connection with the coincidence of the exuviæ of the extinct animals with those of so many living plants? Which of them should claim a contemporary existence with the human remains? In the event of the discovery Sir Charles determines that the age of man would be fixed at an era before the glacial period. But he must take along the coincidence of the extinct mammalia and the living plants—the "glacial theory" to the contrary notwithstanding.

At a subsequent stage of our Author's work he introduces an assemblage similar to the foregoing, and of the same bearing upon Theoretical Geology. This occurs at Durnten, on the border of the Lake of Zurich, where there is a bed of lignite, from five

to twelve feet thick, which had been worked for fuel, during which operation many organic remains came to light. Among them "are the teeth of an *Elephas antiquus*, a *rhinoceros*, the *wild bull*, and *red deer*. In the same beds I found many fresh-water shells, all of *living* species. The plants are also recent [of living species], *and agree singularly with those* of the Cromer buried forest at Norfolk Cliffs (page 386). Overlying the lignite are, first, stratified gravel, about thirty feet thick; and, secondly, highest of all, huge *angular* erratic blocks." These blocks were not rolled, but wafted by such a debacle as the General Deluge. (See Appendices II. and III.)

At Mercurago, in the north of Italy, in the peat which has filled up one of the lakes, there have been discovered "piles of a lake-dwelling like those of Switzerland (page 377), together with various utensils, and a canoe hollowed out of the trunk of a tree. From this fact we learn that south of the Alps, as well as at the north of them, a primitive people, having similar habits, *flourished after the retreat of the great glaciers.*"

Near Maestricht, on the Meuse, "a section of a canal occurs at the village of Smeermass, about sixty feet deep, the lower forty feet consisting of stratified gravel, and the upper, of twenty feet, of loess [a loamy deposit]. The number of molars, tusks, and bones of elephants obtained during these diggings was extraordinary, and the bones of other mammalia, and *a human jaw with teeth.* The jaw was found at the depth of nineteen feet from the surface. But the jaw was isolated, the nearest tusk of the elephant being six yards removed from it in horizontal distance."

Our Author has an extended disquisition upon the effects of ice during the supposed glacial period, upon erratics or bowlders, successive changes in physical geography, such as the subsidence and elevation of beds, the origin of lake basins, &c., but it has no intelligible relation to the history of man.

As to the "glacial period in Europe," our Author observes that the enduring marks which the glaciers have left "enlarge our conceptions of the antiquity, not only of the living species of animals and plants, but of their present geographical distribution, and throw light on the chronological relations of these species to the earliest date yet ascertained for the existence of the

human race. That date, it will be seen, is *very remote* if compared to the times of history and tradition."

Our Author, in his Recapitulation, remarks that—"Between the newer or recent division of the *Stone Period* and the older division, which has been called the Post-pliocene, there was evidently a *vast interval of time*—A GAP in the history of the past into which *many monuments of intermediate date must be intercalated.*"

This is at once superseded by the consideration that the uncivilized people who occupied the countries which we have now gone over were abruptly succeeded by a race of high cultivation; and therefore we may not expect to find monumental traces intermediate in civilization between those who made the flint implements and the pile habitations and those successors whose descendants have built up London, Paris, &c. We have a case parallel to that in North America, where the earliest and a vast population have left no vestige but mounds of earth, rude specimens of earthenware, and their own bones; and these succeeded by our present Indians of the "Stone Age."

There is, also, a probable parallel between the American continent and the British Isles in relation to the means of communication with other parts of the globe. The existence of huge mammalia upon the island of Great Britain that have long since disappeared, and of some living animals, renders it certain that this insular spot was once connected with the Continent at a period subsequent to the Noachian Flood. It is highly probable, however, that some of the extinct mammalia inhabited the island at a prior era; or, as in many other parts of the earth, the bones, in more or less of the instances, were deposited there by that catastrophe, particularly the "erratic blocks" at Durnten, on the Lake of Zurich (page 387, and Appendix III.). In either case, currents of water have accumulated the bones, flint implements, &c. It is not doubtful, also, that North America was once united with Asia at Behring's Straits; and it is highly probable that similar means of intercommunication existed between Southern Asia and America. The early ages of the earth were attended by great convulsions, and by other causes of violent operation; while renewed convulsions distinguished the era of the Flood, and not improbably, within no long period afterwards, others led

to the dismemberment of South America and Asia, and of the British Isles from continental Europe. (See Appendix II.)

I have now stated all the facts, as related in our Author's work on the Antiquity of Man, that have any direct bearing upon that question, that the reader may see how entirely these supposed evidences have failed of rendering even probable the existence of man for more than a very few thousand years. Nevertheless, I agree entirely with Sir Charles (but for other reasons than assigned by him), that—

"It is clear that Man was contemporary in Europe with two species of elephant, two of rhinoceros, at least one of hippopotamus, the cave-bear, cave-lion, and cave-hyena, various bovine, and equine animals now extinct, and many smaller carnivora, rodentia, and insectivora."

Such were the violent agencies in the early period of the *Mosaic* Earth (see Appendix I.), that the extinction of numerous species of animals, especially the inferior aquatic, would be in the highest degree probable; while, also, the general Deluge contributes largely in explaining the occurrence of superficial fossils in all parts of the globe, as well as the extinction of many species of land animals at an early period after that catastrophe. The few that were then existing, and the destructive causes that were consequent upon such an event, such as an inadequate means of sustenance, &c., readily explain the difference in the numerical ratio between the disappearance of species at that early era and the present day; and the difference contributes to the proof of such a catastrophe.

Since the publication of our Author's Antiquity of Man, a few discoveries have been made similar to those now related, particularly in the Department de la Dordogne, France, where have been found some anomalous bones that "belonged to a gigantic race whose limbs resembled those of the gorilla." But they reflect no light upon the subject before us, excepting that the voluminous capacity of the skulls destroys the supposed consanguinity of the gorilla to the human race. To these may be added the late discovery of the Los Angelos human skull, which not improbably found its way to the bottom of the shaft much after the manner in which Lyell surmises that the fossil bones at Natchez got into the ravine below the cliff (p. 384). There also occurs in

the Records of the Geological Survey of India, for the year 1868, a description, by Dr. Oldham, of an agate flake, of human manufacture, which was found in a deposit supposed to be of the Pliocene Age. Of the latest, or "New Pliocene," Lyell remarks, in his Principles of Geology, that "the antiquity of the Newer Pliocene strata of Sicily must be very great, embracing, perhaps, *myriads of years.*" I should state, also, that I have failed of consulting the work of J. Scott Moore, who is said to have announced a second edition of his Pre-glacial Man and Geological Chronology for three millions of years before A.D. 1800, with addenda and diagrams of the earth's orbit for four millions of years.

There has also recently appeared a work by Dr. E. T. Hamy, "*De Paléontologie Humaine*" (1870), which professes to be a supplement to Lyell's *Antiquity of Man;* but it consists of a brief recapitulation of some of the facts known to Sir Charles, illustrated by numerous figures of stone implements, bones, &c.—forming a popular treatise. It has nothing that advances the hypothesis of the antiquity of man, unless it be the discovery of the humerus, ribs, and vertebræ of an extinct *Halitherium* in the "Miocene" deposit at Pouancé (*Maine-et-Loire*), as described by M. l'Abbé Delaunay (1867), and the supposed connection of which with the existence of man depends mainly upon some equivocal indentations upon the bones. It is considered doubtful, however, by some whether the fractures were made by man. To the same period M. Bourgeois refers an engraved flint found at Thenay (1867), and it is conjectured that certain indented bones found by Garrigon and Filhol at Sansan (1868) "*démontrée la cotemporanéité de l'homme et des mammifères miocènes.*" But Dr. Hamy ascribes very little importance to these supposed testimonials; and remarks that no human bones have been discovered as low down as the so-called "Miocene" deposits; and that the fragments of bones found at Savone are the only supposed testimonials of the existence of man at the "Pliocene" period (or next above the "Miocene"), and that their value is questioned.

As to the rude implements of savage life which are supposed to supply a strong proof of the high antiquity of man, many of the ablest authorities in geological research may be brought to

show that no reliance can be placed upon them. Pfaff has been already mentioned. And here is another late writer of vast experience, SVEN NILSSON, who, in his work on the "*Primitive Inhabitants of Scandinavia during the Stone Age*" (third ed., 1868), after a critical description of the various stone implements discovered in Scandinavia, observes, that—

"A remarkable fact in this branch of ethnography is the *great resemblance* that exists among the stone implements of nations of *different tribes during very different periods, and in the most distant countries of the earth.*" He compares the sepulchral monuments of Scandinavia, during the Stone Age, with the dwelling-houses of the Esquimaux—"In Greenland and in North America," he says, "we find in the winter huts of the Esquimaux a *most surprising similarity* to our Scandinavian tumuli of the Stone Age." "The people who built the *tumuli*, and who were a strong and robust race, had already appeared BEFORE the Bronze people, and *during* the proper Stone Age."

FIGUIER, in his popular work on *Prehistoric Man*, supplies nothing in relation to the "Stone Age" that is more indicative of a high antiquity of the race, so far as the implements contribute their light, than is embraced in Lyell's Antiquity of Man and Nilsson's Prehistoric Scandinavians, and comparatively little of that; or as denoted by similar fabrications that were lately in universal use by the present savages of North America, and who, as in Scandinavia, were preceded by a race that built the mounds and tumuli, besides other relics which denote a much higher civilization than the stone implements of their successors. Similar implements have been found in such abundance in some parts of France as to show the probability of workshops for their manufacture. At Pressigny thousands were found, in 1864, lying superficially in *vegetable mould*, over an extent of three or four acres—consisting of flint-hatchets, knives, &c.

At the meeting of the "International Congress of Prehistoric Archæology," held at Norfolk, England, Aug., 1868, the President, Sir JOHN LUBBOCK, in his Address, thought it important to refer to the opinion of the DUKE OF ARGYLL—"who," he remarked, "was entirely with the Archæologists on the antiquity of the human race, but differed from them on the subject of the prehistoric ages." The Duke had said—"I must observe that

Archæologists are using language on this subject which, if not positively erroneous, requires, at least, more rigorous definitions than they are disposed to attend to. They talk of the Old Stone Age (Palæolithic), and the Newer Stone Age (Neolithic), and of the Bronze Age, and of the Iron Age. Now *there is no proof whatever* that such ages ever existed in the world. If it were true that the use of stone has in all cases preceded the use of metals, it is quite certain that the same age which was an age of stone in one part of the world was an age of metal in another. As regards the Eskimo and South Sea Islanders, we are now, or were very recently, living in a Stone Age." To which Sir John added—"It is evident, also, that some nations, such as the Fuegians and the Andamaners, etc., are living now only in an age of stone."*

Similarity in the implements of a rude people in different ages and countries arises from the natural constitution of the human mind, which, in its uncultivated state, has always resorted to the same ways, as witnessed at the present day, as the most obvious and simple, and is a proof of the coincident condition of the human mind at the earliest dawn of savage life, and as now presented by the barbarous tribes.

Nevertheless, nothing can be inferred as to the early progress of knowledge in civilized nations from its low condition among others. In the latter case it is due either to a deterioration of the higher standard of the human mind, or to habit and surrounding influences; the former of which is exemplified among the African races, while the latter is most remarkably seen in the decline of nations, and more naturally in a devotion to the indolent ease of a pastoral life, or to the fascinations of the chase.

Professor DANIEL WILSON, of the University of Toronto, after describing extensively in his large work on Prehistoric Man (1862), the stone and copper implements, and the varieties of mounds which are referable to the uncivilized tribes of North America, arrives at the conclusion, as expressed in his chapter on "Guesses at the Age of Man," that there is nothing in vestiges of this nature that denote any thing beyond a recent origin

* I may say, also, that he has nothing in his late work on "The Origin of Civilization and the Primitive Condition of Man" beyond what is relative to human progress.

of the human race. In the last sentence of his elaborate work he says:

"I venture to believe that to many reflecting minds it will appear that we do in reality make so near an approach to a beginning in relation to man's intellectual progress, that we can form no uncertain guess as to the duration of the human race, and find, in this respect, a *welcome evidence* of harmony between the disclosures of science and the dictates of Revelation."

Nor does the alleged objection as to the early appearance of the Negro affect the question, since, according to Professor Müller, of Brussels, and other African travellers, there are regions in Africa where the coloring matter of the skin is rapidly introduced or removed by climate. But it is not improbable that the Negro was a natural variety, just as a white person or Albino has been the offspring of perfectly black parents. There may have been only one, climate contributing its aid to the color of his or her descendants. As to other races, whatever their color, stature, &c., upon which so much has been said of the slow operation of climate in introducing the varieties, the analogies in relation to the varieties among animals and plants, as well as observations like those of Müller, assure us that a thousand years or less may have wrought the changes; and which, unlike malformations, are of a constitutional and hereditary nature.

In regard to the progress of human knowledge as an evidence of Man's antiquity, Sir Charles Lyell has this remark in his Recapitulation:

"We see in our own times that the rate of progress in the arts and sciences proceeds in a geometrical ratio as knowledge increases; and so, when we carry back our retrospect into the past, we must be prepared to find the signs of retardation augmenting in a like geometrical ratio; so that the progress of a thousand years at a remote period may correspond to that of a century in modern times, and in ages still more remote Man would more and more *resemble the brutes in that attribute which causes one generation exactly to imitate in all its ways the generation which preceded it.*"

Here our Author clearly avows his opinion of the descent of Man from the brute, and that he inherited at his earliest evolution those characteristics which are the distinguishing peculiari-

ties of Instinct, and which impel every species of animals "to imitate in all its ways the generation which preceded it." (See Demonstration of Instinct, Chapter XVI.) The foregoing quotation is an impressive example of a series of false conclusions of the most momentous importance, both in a scientific and religious aspect, and predicated of an assumption wholly destitute of foundation—that is, the assumed high antiquity of the human race. Were that assumption a truth, then, indeed, would man have made no progress, even in the rudest arts, for tens of thousands of years, and every "century," nay, every year since the beginning of Babylon, Nineveh, and Thebes, would far surpass in its intellectual development all those 100,000 years during which "one generation continued, like the brute, to imitate that which preceded it"—in the manufacture of stone knives and arrow-heads. It was a foregone conclusion that the first of the race must have so closely resembled "the brute" as to sanction the great object of establishing a high antiquity as indispensable to the Darwinian doctrine of man's descent from a brutal ancestor. In support of this object Sir Charles goes back for an authority to an *unscientific*, heathen people, and brings up Horace in the following manner:

"The opinion entertained generally by the classical writers of Greece and Rome, that Man, in the first stage of his existence, *was but just removed from the* BRUTES, is faithfully expressed by Horace. 'When animals,' he says, 'first crept forth from the newly formed earth, a dumb and filthy herd, they fought for acorns and lurking-places with their nails and fists, then with clubs, and at last with arms, which, taught by experience, they had forged. They then invented names of things, and words to express their thoughts, after which they began to desist from war, to fortify cities and enact laws.'"

The opinion of the brutal nature of the earliest of mankind, as founded upon our Author's premises, is contradicted by the savage hordes who now inhabit the earth, and who continue to imitate, more or less, the degenerate habits of their predecessors. In many of the instances the adherence to the past arises from the charming indolence of nomadic life. As Tacitus says of the cultivated man—"There is a charm in indolence that works by imperceptible degrees, and that listless inactivity which at first

is irksome grows delightful in the end." Other tribes, such as the North American Indian, who offer examples parallel in their "stone implements" with the geological man, adhere to the usages of their ancestors on account of the excitements of the chase and of war; and other races, like the blacks of Africa, linger in the past from a deterioration of mental ability that is not likely to become exalted to the primitive standard—hard, perhaps, but so ordained by the modifying effects of physical influences, and by the law of inheritance. Yet none of these races approximate the brute any more than the most creative Genius of the Caucasian race. Such a degradation is fully confronted by the disclosures of "Science." (See Chapter VII.)

Retrogression in knowledge is another characteristic of the human mind. Nations rise and fall as if by a law of nature; but while one is falling another is rising.* Europe has had its "Dark Ages," when, for six hundred years, there are few materials for history; but in the mean time science and art were blazing in Arabia. And where is Arabia now? But there has ever been a steady progress in knowledge among some of the nations, and doubtless such will continue to be the case throughout an indefinite future. Nothing of the past is lost, but, on the contrary, it becomes sooner or later the source of improvements. "*Vires acquirit eundo;*" or, as Horace has it—"*Labitur et labetur in omne volubilis ævum.*"

Although advances in some of the arts, as resulting from antecedent improvements, have been remarkably great within a century past, it only goes to the proof, in view of the constitution of the human mind, that Man has occupied the earth but a very few thousand years. And our Author is not less mistaken in supposing that the sciences, with the exception of inorganic Chemistry, have made advances in any thing like a geometrical ratio during the last hundred years. He has manifestly founded his conclusion upon what is embraced under the designations of "Modern Science" and the "New Philosophy"—such as the "Science of Modern Geology"—the "Science of Darwinism"—the "Science of the Antiquity of Man"—the "Science of Crea-

* Ἡμέρα κλίνει τε καναγει πάλιν
Ἅπαντα τα ἀνθρώπεία.

Time both degrades and raises all human things.—SOPHOCLES.

tion by the Forces and Laws of inorganic nature"—"the Correlation or Equivalence of Physical and Vital Forces," &c., &c. But I shall have endeavored to show that these innovations have not only retarded the progress of the sciences, but carry them back into darker ages. Besides what I have already shown of their fallacies, let us glance for a moment at the science of Medicine. What are its principles now? They are founded upon the Equivalence of physical and vital forces, and the revelations of the Chemist's laboratory and the microscope, instead of the phenomena of disease and the profound physiological processes of animal organization—the old humoral pathology restored—the practice mostly limited to purifying the blood and neutralizing poisons, or destroying animalcula or larger insects, and substituting tonics and stimulants for the antiphlogistic treatment of fevers and inflammations, which had been inculcated by every enlightened medical Author from the time of Hippocrates to our own day. But I have gone extensively over the whole of that ground in my Medical and Physiological Commentaries, and in the Institutes of Medicine. And then as to Chemistry—has not its progress been essentially retarded since it has given its attention to the manufacture of organic compounds, and especially since it invaded the domain of Physiology, and even of practical medicine, as inaugurated by Baron Liebig?

But whence came, it is asked, that high advancement in knowledge which is witnessed in the monumental records of Assyria and Egypt? Does it not imply a long antecedent march through those low stages of mental development that are denoted by the several Ages of Stone, Bronze, and Copper? Does it not dismiss from the Bible the Record of the Noachian Flood, so near, reputedly, to Nineveh and Thebes? Here Geology supplies us with a lever which may at least be made to overturn its evidences of a pre-Adamite Man. The objection raised is of no value in the presence alone of the architecture of the Ark, modelled and finished under God's instructions. And who shall presume to define the knowledge that was imparted to Adam and his immediate descendants, or what might have been their acquirements during a life verging upon a thousand years? What would have been the accumulated knowledge in the lifetime of an antediluvian, if, as Sir Charles says of our own times,

"the rate of progress in the arts and sciences had proceeded in a geometrical ratio as knowledge increased?" Adam became at once an agriculturist. Mankind had become so multiplied at an early day that Cain "builded a city (or, rather, Heb., *was building*), and called the name of the city after the name of his son Enoch." All this accumulated knowledge was delivered over by Noah and his sons to their descendants—Noah having lived 350 years, Shem 500 years after the Flood; and Ashur, the son of Shem, is supposed to have begun the building of Nineveh. It is also not improbable that the foundation of Babylon was begun even in the lifetime of Shem; for it is stated by LAYARD, in his "Discoveries in Nineveh and Babylon" (Second Expedition), that—"If, as Egyptian scholars assert, the name of Babylon is found on monuments of the eighteenth Egyptian Dynasty, we have positive evidence of its existence at least in the fifteenth century before Christ."

It is an established fact, so far as reliable observation goes, that the human mind was alike endowed in the remotest past as at the present day, and is constitutionally so progressive that, as soon as the race in any great region of country exceeded in numbers the natural means of subsistence, which would have happened at least within one or two thousand years, they would have addicted themselves to the cultivation of the earth and other useful arts, and there should have descended to us from those early stages of society corresponding evidences, unless destroyed or entombed by a general deluge. Exceptions would have constantly existed, as at the present day, when scattered tribes would have been devoted to the excitements of the chase and of other habits of savage life, till impelled, by the want of the necessary means of subsistence, to betake themselves to other pursuits. And if the supposed high antiquity of the race had any plausibility, the populations should have crowded the entire globe before the expiration of a tenth part of the lowest geological estimate of 100,000 years.* This is manifest from the increase of mankind during the last 4000 years, and a prospective

* "*The law of the geometrical rate* of the increase of population," says Lyell, "which causes it always to press hard on the means of subsistence, would insure the migration, in various directions, of offshoots, from the society first formed abandoning the area where they had multiplied."

view of its extent at the end of 6000 years more. As an example of increase in the New World, it may be reasonably supposed that within a century hence the present United States will have a population of 400,000,000—starting with about 4,000,000 in 1790.

The origin of the monumental vestiges of the race of a higher order than stone and brass implements lies within the compass of four thousand years, and the relics that have been lately produced in support of the geological periods can not be shown to be of a much earlier date than the Egyptian and Assyrian architectures. We meet with no monumental records intermediate between their ruins and the implements of the supposed "Ages of Stone and Bronze;" but, on the contrary, we come abruptly upon a high state of development of the Arts.

CAROLINE PAINE remarks, in her "*Notes of an Oriental Trip*" —"No wonder that Bruce was regarded as a great story-teller. Whose solitary word could be sufficient to satisfy even a credulous world that there had been found in Thebes, in a state of freshness, as if the work of yesterday, such skillful designs, telling a tale of the luxury, refinement, and elegance, the knowledge of arts and sciences, of a people who existed more than three thousand years ago?"

What a "gap is here to be filled!" Where are the intermediate links? The general Flood answers—swept away, or buried universally and at one time, just as the forests were extirpated and more or less imbedded in the earth. (See Appendix III.) Corresponding with this is the coeval poetry of Job; and at no distant day thereafter we meet with the Psalms of David and the Proverbs of Solomon. Where are the evidences of the gradual approaches of human culture towards this unrivalled culmination of the intellectual powers? Their obliteration is an equally conclusive proof as the absence of all vestiges of advancement in the arts antecedently to the foundations of the Assyrian and Egyptian cities, that some great diluvial catastrophe must have been the common cause of this universal destruction of the memorials that had illustrated the advances of knowledge throughout the preceding ages. Without Revelation our knowledge of man's existence would begin with the people of Egypt and Assyria, and thus their monumental remains bear

the highest possible evidence of the invasion of a universal deluge not many centuries anterior to the foundation of Babylon, Nineveh, the "hundred-gated Thebes, the earliest Capital of the World."* And farther, this physical proof of the Flood is immensely enhanced by an equally conclusive demonstration which is to be found in this earliest recorded advance of the human mind in the arts of civilization, since this must have been derived from a people who have left no records behind them; and to this conclusion Theoretical Geology and all deniers of the Noachian Flood must submit. Homer does not refer to Babylon or Assyria, which shows that their influence had scarcely come within the regions which he surveys. The descendants of those "flint-tool" tribes who are represented by Tacitus as living upon the morasses of the Vistula have built St. Petersburg and Moscow. Whatever may be said in behalf of China of a higher antiquity than the reputedly "first Dynasty," which is supposed to have begun with the Emperor Yu, 2217 B.C., is evidently fabulous. Such was the opinion of Confucius, who had before him the mythological histories of more ancient kings; but he had no confidence in them.

A difference of opinion, however, exists among learned men as to the precise date of the origin of the most ancient monuments of an advanced civilization. They agree in beginning with Menes, whom Lepsius supposes to have founded the Egyptian Monarchy 3892 years B.C.; Bunsen, 3623 years; Uhlemann and Seyffreth, 2780 years; Poole, 2717 years. This difference in the estimated dates naturally arises from the nature of the records and the fables of the age. But were the earliest date founded upon reliable data, it would not affect the question immediately before us, and only denote an error of a few hundred years in the estimated time of the Flood.

A search, therefore, for any evidences of human progress at an earlier date than such as are supplied by Egypt, Babylon, and Nineveh, unless of a very limited nature, will be fruitless, and

* Sir JOHN LUBBOCK remarks, in his late work on the *Origin of Civilization and the Primitive Condition of Man*, that—"The facts and arguments mentioned in this work afford, I think, strong grounds for the following conclusions, namely, that existing savages are not the descendants of civilized ancestors—that *the primitive condition of man was one of utter barbarism.*"

unless, also, of antediluvian origin; since mankind could not have sufficiently multiplied to have accomplished any great work during the first five or six centuries after the Flood. At the expiration of that time, however, we may reasonably look for the commencement of such cities as Thebes, Babylon, and Nineveh.

Nor can it be assumed that the evidences of improvement which may be supposed to have connected the stone implements with the monuments of a high civilization have been buried by any geological catastrophes, as this is contradicted by the numerous known localities of the stone implements with which the "Ages" begin. Nevertheless, as soon as this precautionary remark was written I came upon the equally conservative information in Lyell's work on the Antiquity of Man, under the head of "*Imperfections of the Geological Record.*" Thus, our cautious Author:

"When treating in Chapter VIII. of the *dearth of human bones* in alluvium containing flint implements *in abundance*, I pointed out that it is no part of the *plan of Nature* to write everywhere, and at all times, her autobiographical memoirs. Even of those ancient monuments now forming the crust of the earth which have not been destroyed by rivers and waves of the sea, or which have escaped being melted by volcanic heat, *three-fourths* are submerged *beneath the ocean*, and are *inaccessible* to man; while of those which form the dry land, a great part *are hidden* forever from our observation by *mountain masses thousands of feet thick piled over them*"—with the unaccountable exception of the abounding stone implements and their associate extinct mammoths, elephants, rhinoceroses, &c., unless it be for the special benefit of "Modern Science." And as the origin of Man is referred by the Science to the monkey tribes, it is an ominous coincidence with "the dearth of human bones" that not a brute of the tribe of apes has been found in the alluvium of the stone implements. But what connection, I would ask, has the "dearth of human bones" with that "crust of the earth" which, geologically speaking, preceded Man and the alluvium of the stone implements by myriads of ages? A better reason, such as a sparse population, must be made to interpret "the dearth of human bones."

Again, Sir Charles, apparently anticipating objections to the absence of connecting-links between the primeval man and the advanced in the arts of civilization, resorts to another of those assumptions which enter so largely into Theoretical Geology—

"If," he says, "in conformity with the theory of progression [that is, progressively from the lowest to the highest organization], we believe mankind to have risen slowly from a rude and humble starting-point, LEAPS may have successively introduced not only HIGHER FORMS and grades of intellect, but at a much remoter period *may have cleared* AT ONE BOUND *the space* which separated the highest stage of the UNPROGRESSIVE INTELLIGENCE *of the inferior animals from* THE FIRST and lowest form of IMPROVABLE REASON manifested by Man." That is to say, Man "bounded at one leap" out of a brute.

The foregoing attempt to overcome insuperable difficulties can have no other object than that of facilitating the way for the Darwinian development of Man, and his "improvable Reason" out of a "brute," as suggested in a preceding quotation from the work before us on the Antiquity of Man (page 394).

Human Reason, I say, was constitutionally as creative at its earliest dawn as at any later period, and the multiplication of mankind, under equal circumstances, went on then as now. The invention of the Alphabet is lost in the mists of antiquity, while the comparatively very inferior art of Printing is of modern date. Science had scarcely dawned when the Author of Job, and David, Solomon, Isaiah, and Homer wrote, and no better thinkers and writers have since appeared. Greece and Rome perfected History, Oratory, Sculpture, Painting, Architecture, soon afterwards; the immortal Hippocrates had laid the foundation of Medicine 400 years B.C.; and two thousand years more bring us to our own times. If, therefore, so much had been accomplished within the two thousand years before Christ, beyond which we can not ascend, and such a host of brilliant minds contributed to the earliest page of history, what, I say, would not this same creative Mind have produced had it been in operation ten thousand years before the structures, and sculptures, and writings of Babylon, Nineveh, and Egypt? It is now too late, as the facts are too numerous and demonstrative, for the afterthought that the human mind has been subject to changes since

the law of "natural selection," or any "law" within the compass of imagination, produced the physical organization of the race; and, moreover, what is known of the unvarying nature of Instinct in all species of animals determines the same stability for human Reason. But, although this be true of Reason in its general aspect, it differs from Instinct in its slow approaches to maturity, in cultivation, &c., in every individual, and in manifesting gradations throughout the masses of society. Eminent Genius does not often illuminate the world; but it sparkles as well in the ancient as in modern times. Tacitus, looking down from his predecessors to our own age, remarks, in his *Dialogue concerning Oratory*, that—

"There is a general law of nature, hard, perhaps, but wonderfully ordained, and it is this: Nature, whose operations are always simple and uniform, never suffers in any age or country more than one great example of perfection in the kind. This was the case in Greece, that prolific parent of genius and of science. She had but one Homer, one Plato, one Demosthenes. The same has happened at Rome—Virgil stands at the head of his art, and Cicero is still unrivalled. During a space of seven hundred years our ancestors were struggling to reach the summit of perfection. Cicero at length arose. He thundered forth his immortal energy, and Nature was satisfied with the wonder she had made. The force of genius could go no farther. A *new road to fame* was to be found. We aimed at *wit, and gay conceit, and glittering sentences.* The change, indeed, was great, but it naturally followed the new form of government. Genius died with public liberty."

The review which I have now made of the alleged evidences of the high antiquity of Man, and of the ages during which he is supposed to have been slowly elevated above the brute, naturally leads us to inquire where, in the calendar of time, shall we place those historical people, Adam, Eve, Cain, Abel, and so on down to Noah, who was contemporary with the immediate descendants of Adam, and with the Postdiluvians three hundred and fifty years? What disposition shall be made of the account of Creation? What of the events in the garden of Eden? What of the meaning, the authenticity, and the value of such affirmations as the following: "For as in Adam all die, even so in Christ

shall all be made alive." "The *first man* Adam was made a living Soul, the last Adam a quickening Spirit." "Death reigned from Adam to Moses, even over them that had not sinned after the similitude of Adam's transgression, *who is the figure of Him that was to come*," &c., &c. Where shall we look for the origin of sin, and what shall be said of its imputation to Adam and Eve? Thus, and in various other ways, both in the Old and New Testaments, we learn that if the Mosaic account of the Creation of Man be rejected, so must be all in the Scriptures that is of any interest to mankind. If Adam was not the first Man, then is "our preaching vain, and your faith also vain"—words without meaning, a mere delusion.

I am reminded, by the booming of cannon on this day of the centennial anniversary of the birth of Baron VON HUMBOLDT, of the very high authority of this Philosopher, and his opinion on the question before us may not be neglected. This will be the more interesting by placing in immediate connection with his defense of the high antiquity of the human race his opinion of the relation of Life to the physical forces, and his approval of the nebular hypothesis. Indeed, from the circumstance of his having espoused the materialistic doctrine of Organic Life, I had occasion, in the *Institutes of Medicine*, to advert, in the following manner, to opinions which led the accomplished scholar EDWARD EVERETT to say that the Baron "owes his position in the intellectual world to his grasp of the whole domain of science, and the *majestic range of his generalizations*."

The Baron, in his "generalization" of the forces and phenomena of nature, undertakes, upon this scheme of philosophy as applicable to *inorganic* matter, to bring the *organic* world within the domain of that philosophy, a distinct enunciation of which occurs in his "*Aspects of Nature*." Thus—

"Reflection and continued study in the domains of Physiology and Chemistry," says this learned man, "have shaken my earlier belief in a peculiar so-called Vital Force. In 1797, at the close of my work entitled 'Versuche,' &c., I already declared that I by no means regarded the existence of such peculiar Vital Forces as demonstrated. Since that time I have no longer called peculiar forces what may possibly only be the operation of the concurrent action of the several long-known substances and their material

forces." "I have said, in '*Cosmos*'—'The myths of imponderable matter and of Vital Forces peculiar to each organism *have complicated* and *perplexed* the view of nature.'" It should here be considered that this degradation of man and other living beings formed an indispensable element in our Author's plan of the "generalization of nature." Without it, *Cosmos* could not have been written. "The view of nature" would have been too much "perplexed."

Besides the disposition which I have always endeavored to manifest of affording the physical school of organic nature an opportunity of explaining their philosophy in their own unreserved way, I have also in view, in the present case, my oft-reiterated proof that it is the tendency of this generalization of the forces of nature to conduct its projectors and advocates to still greater violations of physiological laws, since those laws positively enjoin an ascription of the "first origin" of every existing species of animal and plant to a Supreme, Intelligent, Creative Power. But, since this is ignored by the doctrine I am about to cite, there is necessarily an attendant implication by our Author that man and other organic beings were "brought forth," in the language of Theoretical Geology, by the "parturitive powers of the earth;" or, as explained physiologically, the properties or forces impressed upon matter assembled the requisite sixteen or seventeen elements for every species of animal and plant, after having decompounded their binary compounds, and then united them into an almost endless variety of precise ternary, quaternary, and more complicated compounds; then arranged them into a multitude of organs of complex designs, developed Reason and Instinct, and ended by enabling man, and all mammiferous animals and unfledged birds, to provide sustenance for themselves in their state of infancy. (See Chapter VII.) Here is the intended paragraph from Cosmos, which lets us farther into the philosophy of "positive science." Thus—

"In a work like the present we can venture on no more than an allusion to *the mysteries that involve the question of modes of origin*"—"Geographical investigations regarding the ancient seat, the so-called 'cradle of the human race,' are not devoid of a *mythical* character." Our Author then quotes approvingly from his brother William, as follows: "We do not know, either from

history or from *authentic tradition*, any period of time in which the human race has not been divided into *social groups*. Whether the *gregarious* condition *was original*, or of subsequent occurrence, *we have no historic evidence to show*. The separate mythical relations found to exist independently of one another in different parts of the earth appear to refute the first hypothesis, and concur in ascribing the generation of the whole human race to the union of one pair. The general prevalence of *this myth* has caused it to be regarded as a traditionary record transmitted from the primitive man to his descendants. But this very circumstance seems rather to prove that it has *no historical foundation*, but has simply arisen from an identity in the mode of intellectual conception, which has everywhere led man to adopt the same conclusion regarding identical phenomena; in the same manner as many myths have doubtless arisen, not from any historical connection existing between them, but rather from an identity in human thought and imagination. Another evidence in favor of the *purely mythical nature* of this belief is afforded by the fact that the *first origin* of mankind—a phenomenon which is wholly beyond the sphere of *experience*—is explained in perfect conformity with existing views, being *considered on the principle of the colonization of some desert island or remote mountainous valley at a period when mankind had already existed* for thousands of years. It is in vain that we direct our thoughts to the solution of the *great problem of the first origin*, since man is too intimately associated with his own race and with the relations of time to *conceive of the existence of an individual* independently of a preceding generation and age [or self-existent]. A solution of those difficult questions, which can not be determined by inductive reasoning or by experience—whether the belief in this presumed traditional condition be actually based on historical evidence, or whether mankind inhabited the earth in gregarious associations from the origin of the race—can not, therefore, be determined from any philological data; and yet its elucidation ought not to be sought from other sources."

We may not be surprised, therefore, that our Author's generalization of nature embraces Laplace's doctrine of the evolution of the solar system, and now generally adopted by Geologists and Astronomers. Besides its entire departure from the Mosaic

Narrative, the subject is invested with a certain degree of physiological interest, on account of the constitution of the primary rocks, and the analogical reasoning which may be thence carried to the origin of living beings in the forces and laws of inorganic nature from the assumed evolution of those rocks from a gaseous chaotic state, exclusively through the properties impressed upon matter. This I endeavored to expound in my work on Theoretical Geology, and recur to the subject now (and to be resumed in Appendix I.), for the purpose of showing the extent of the harmony with which Cosmos has carried out the generalization of nature, and of giving to its system all the advantages that can inure from any consistency; or, on the other hand, of enabling it to accept as graciously the penalties of any defects, and thus subserve, in either case, some of the greatest truths and principles in nature and Religion. The following extract embraces the doctrine. When speaking of the origin of aerolites, he says—

"I would ask why the elementary substances that compose one group of cosmical bodies, or one planetary system, may not in a great measure be identical? Why should we not adopt this view, since we may conjecture that these planetary bodies, *like all* the larger or smaller agglomerated masses revolving round the sun, have been thrown off from the once far more expanded solar atmosphere, and been formed from vaporous rings describing their orbits round the central body."

In respect to the "Nebular Hypothesis," I shall endeavor to demonstrate its fallacy, as well as its conflict with Revelation, in Appendix I. It is now my purpose to remark of the foregoing quotations that if the want of "*experience*" disqualifies us for judging of "the first origin of mankind," and if we do not choose to accept the Mosaic Narrative as "historical," it is highly incumbent upon physiological science to show that the laws of nature utterly contradict the doctrine that organic beings were evolved by those laws, and that they, therefore, proclaim the dependence of such beings upon an Intelligent, Personal Creator. In the former case we have an ample amount of "experience," and if the latter be admitted, all nature ceases at once to be mysterious, and mystery associates itself with God alone. The doctrine of "experience" is as applicable to all the miracles and prophecies of the Old Testament, and to all the most essential

means upon which the authenticity of Christianity depends, as to the origin of mankind; and it would be quite as fatal in science, and even in the ordinary pursuits of man, as it is to Religion. It is even possible that Humboldt would not have won laurels in America had it not been for the inductive philosophy of Columbus. Our Author appropriates in Cosmos the historical facts of the Old Testament, so far as they relate to simply human affairs, because it alone informs us of that era of mankind, and this information was important to Cosmos. And herein lies the distinction between that *experience* which is so readily accepted on the mere testimony of man, and that in which man's agency is associated with Divine interposition, till it finally culminates in the distinction between *experience* and *faith* in their abstract relations. A trust, therefore, in the merely historical facts of the Bible (for our Author has been defended upon this principle) is no proof whatever of a belief in Revelation or in its Author—no more so than the Jew's trust in the biography of Christ, as it respects His humanity, is a proof that he is a Christian. It is not unusual, indeed, as we have already seen, for the mere Pantheist to employ the terms *creator*, "the unknowable," and sometimes even God, as a sort of compromise with the Theist, and even to make professions of Christianity. But this has signally failed after the day of novelty, and personal influence, and mutual admiration has ceased, and the authors and actors have passed into history. Injustice is sometimes done, as was remarkably the case with the *Religio-Medici*, for, although it abounds throughout with evidences of the highest order of faith, yet its Author incurred the charge of infidelity; and more than fifty years after his death, when time had extinguished animosities, Samuel Johnson thought it necessary to contribute the weight of his mind and character to the just cause of rescuing the Author's memory from this imputation, notwithstanding Browne had made an able defense of himself. But it shows the strong course of reason in its deliberations upon doctrines and professions. It shows us emphatically that no such rescue can await those who reject or explain away the Narrative of Creation—even such as do not accept its obvious interpretation. The demonstration made in Chapter VII. of the creation of man and animals in a state of maturity, and of

the absurdities of all the doctrines that depart from the Mosaic account of the origin of living beings, imparts an immense force to the probability that all other parts of the Narrative of Creation must be received in that same literal sense which had for ages commended itself to the unhesitating judgment of mankind. But in our next following chapter, and in Appendix I., I shall bring up a strong amount of proof to substantiate what my demonstration of the creation of man and animals in a state of maturity so forcibly implies. Were the Narrative of Creation dismissed from the Bible by common consent, or in any respect modified in its statement as to the production of man and animals in a mature condition, all that relates to the science of organic life would still remain an impregnable shield in its defense.

An admission that the Bible is, in a general sense, a work of great use to mankind on account of its moral influences, is by no means a proof of belief in a personal God. And equally so, for the same reason, a countenance has been given by the Infidel even to Christianity. Their useful influences are admitted by all; and the propagandist of infidelity finds his most successful policy in avoiding direct collisions with religious faith, and occasional affectations of a devout sentiment. The admonitions of history have taught him this useful lesson. But the general import of the doctrines inculcated forms the criterion by which the verdict is adjusted; and this, as we have just seen of the distinguished Author of that truly pious work, the *Religio-Medici*, is apt to be rigorously dispensed. And so with Baron Humboldt, with incomparably greater justice; of whom it was said by Professor Agassiz, in his Address on the Humboldt centennial anniversary, that—"*The modern school of Atheists claim him as their leader.* As such we find him represented by BURMEISTER in his scientific Letters. Others bring forward his sympathy with Christian culture as an evidence of his adherence to Christianity in its broadest sense. It is difficult to find in Humboldt's own writings any clue to the exact nature of his own convictions."—New York DAILY TRIBUNE, September 15, 1869.

Finally, besides the great question of the identity of the forces and laws of organic and inorganic beings, the present discussion, like much of the preceding, has been equally in behalf of scientific interests, especially that which concerns organic life; for

nothing can be more opposed to the "experience" upon which are founded the facts and principles in physiology than the assumed or implied origin of living beings in the forces which rule the inorganic world; and coming to the intricate, but methodical constitution of the primary rocks, the evidence of a direct interposition of Creative Power, acting in co-operation with the properties impressed upon matter, is as palpable as the more complete exercise of the same Power in the production of living beings out of the elements of matter. But the demonstration as to the exercise of Creative Energy in the formation of the globe will be reserved for Appendix I. To assume, as does the nebular hypothesis, and that of the spontaneity of living beings, that the elements of matter were endowed with the independent power of generating their organized conditions, is so contrary to all experience and the surrounding facts, that it supposes a condition of things that is equivalent to Creative Energy; according to our demonstration in Chapter VII. It is an illusion, therefore, to imagine that science divests itself of causes that elude its ambitious grasp by assuming that "blind material forces" will explain the origin of both living beings and the primary crystalline rocks, since, in either case, it demands a condition of forces and laws which experience assures us, and science admits, does not exist at present, and therefore has never belonged to the constitution of nature. Science, therefore, in separating from Supernatural Power, convicts itself of inconsistency; for it is contrary to all "experience," to all that is known of nature, to suppose that living beings, or the primitive earth, emerged from the elements of matter without at the same time supposing that some supernatural agency was concerned in the work. In the one case, therefore, science stultifies itself; while, in yielding to the agency of an Intelligent Creative Power, it simply obeys the exigencies of the facts and the dictates of that Reason which professes to be a rude imitator of some of the Designs which challenge its faith in a higher order of Reason.

CHAPTER XIII.

THEORETICAL GEOLOGY, CONTINUED, IN ITS RELATIONS TO ORGANIC BEINGS, TO THE DEVELOPMENTAL DOCTRINES, AND TO THE NARRATIVES OF CREATION AND THE FLOOD.—THEOLOGICAL GEOLOGISTS RESUMED.

In the present chapter I shall have much to say of the Narratives of Creation and the Flood, and the demonstration of their Divine origin will be continued in the Appendices. These Narratives, independently of their general interest and importance, may be shown by a variety of concurring proofs to have been direct and literal Revelations to man. The first establishes the endowment of man with a Soul—"created a living Soul"—and that so far he is made "in the Image of God." But the Narrative is so perverted by Theoretical Geology as to render it worthless; and as to that of the Flood, it is now very generally abandoned as a myth. One proof alone, however, as will be shown in Appendix II., and farther substantiated in Appendix III., determines, by its comprehensive import, the Divine Revelation of the Narrative of the Flood in its various details. That particular proof consists in the capacity of the Ark, since, as will be shown in Appendix II., its capacity was most ample for all the land animals known at the present day, and for an abundant supply of food; while a ship of a thousand tons would have accommodated all the land animals known to Moses. How absurd, therefore, the supposition that the writer of the Narrative would have devised a structure of the dimensions of the Ark. In this connection I would also refer to the important proof of a general flood, at the reputed era, which I have suggested in the preceding chapter—namely, that there are no monumental vestiges of any advances in the arts of a higher antiquity than those of Egypt and Assyria, where we abruptly meet with a high order of civilization.

And now, leaving for a moment our method of direct facts and

arguments, I would ask those clergymen who falter in their faith as to the Noachian Flood, whether they do not inflict upon Christianity a very dangerous wound by necessarily discarding along with the Flood one of our Saviour's most emphatic declarations of His mission for the salvation of man? What answer will they make to the infidel who may challenge them with the following words:

"AS THE DAYS OF NOAH WERE, *so shall also the coming of the Son of Man be. For as in the days that were* BEFORE THE FLOOD *they were eating and drinking, marrying and giving in marriage, until the day that* NOAH ENTERED INTO THE ARK, *and knew not until* THE FLOOD CAME, AND TOOK THEM ALL AWAY; SO SHALL ALSO THE COMING OF THE SON OF MAN BE."

There is no possibility of evading this most important and solemn parallel which our Lord institutes between the antediluvian and post-diluvian world, between the unexpected Flood and His own coming, &c.

And farther: the exploded Narrative of the Flood has a very important bearing upon the *developmental* schemes, and therefore upon the doctrine of *materialism* as to the Soul. If there were a Flood, and man and animals were preserved as related, it establishes the *one only* Creation as revealed. I shall, therefore, have something demonstrative upon the subject in Appendices II. and III. If the Narrative of Creation be admitted to be of Divine Authority, then also must be that of the Flood, since the construction, consistency, and other various internal proofs of both Narratives, are so much alike, there could have been but one writer for both. Moreover, the preservation in the Ark, "*to keep seed alive upon all the face of the earth,*" represents the Creator as acting with that consistency which we unavoidably associate with Infinite Wisdom in the perpetuation of a systematic whole, and is fatal to all the hypotheses of progressive developments, of antecedent creations and extinctions, and of post-diluvial creations. The foregoing statement in the Narrative is clearly equivalent to an affirmation that there had been none of the creations and extinctions which Theoretical Geology teaches; else why should not the Creator, in His consistency, have continued that supposed system, or, at least have carried it out in relation to animals and plants? And to suppose a local flood, and an *imperfect* preser-

vation in the Ark and a subsequent creation of such animals as were not preserved, as some have assumed, is to suppose an act of inconsistency whose analogies in the hand of man would subject him to ridicule. Even the admitted preservation of the human race, by the same reasoners, through the instrumentality of the Ark, carries with it, upon Unity of Design, that of terrestrial animals also. The creation of man and animals in a state of maturity, as I have variously demonstrated, particularly in Chapters VII. and VIII., establishes the commencement of the existing condition of organic nature at the very beginning of time. "Male and female created He them. Be fruitful and multiply, and replenish the earth." And such is Divine consistency, the Creator carried out the principle when He introduced His "only Begotten Son" upon earth; and this remarkable consistency in conforming to the law established at "the beginning" allies itself with the other evidences of our Lord's Divinity.

Before proceeding farther with our inquiries, let us look at the present geological estimate of the earth's antiquity, and the premises upon which it is founded. This is very well explained by Büchner in his work on *Force and Matter*. Thus—

"The so-called Coal-formation alone required, according to Bischof, 1,000,177 years; according to Chevandier's calculation, 672,788 years. (See Appendix III.) The tertiary strata required for their development about 350,000 years; and before the originally *incandescent* earth could cool down from a temperature of 2000 degrees to 200, there must, according to Bischof's calculation, have elapsed a period of 350,000,000 years. Volger, finally, calculates that the time requisite for the deposit of the strata known to us must at least have amounted to 648,000,000 years." The process of cooling and the deposit of the strata occupied, therefore, 1,000,000,000 years, *minus* two years. (See Appendix I.)

I shall ultimately return to some of the foregoing statements; but in the mean time I will here dispose of another made by the Author last quoted, that—

"The large telescope of Lord Rosse has disclosed stars so distant that their light must have travelled 30,000,000 years before it reached the earth," or 189,216,000,000,000,000,000,000 miles.

That is the received doctrine. But it involves several impos-

sibilities—such as that of knowing the relative distances of the stars from each other, the intermediate stars between the most remote and the observer, &c. It is just now ascertained that the reputed distance of the earth from the sun (only ninety-five millions) has been exaggerated several millions; while Sirius, which is probably the nearest of the fixed stars, is computed to be not less than $100{,}000 \times 194{,}000{,}000$ miles; and it is conjectured that others are as distant from each other as Sirius from the sun. Herschell supposed that his telescope reached to stars 497 times more distant from us than Sirius, which would require about 1500 years for their light to reach the earth. Admitting this to be true, and allowing 500 years more for Rosse's telescope, it will be giving very ample latitude, or 12,614,400,000,000,000 miles, for the most prolific imagination, or at least as far as any reliable mathematical calculations are likely to penetrate.

The foregoing estimate of the antiquity of the earth affords abundant time for the developmental doctrines of organic beings; and could we not disprove the nebular hypothesis, as I shall attempt in Appendix I., then it must be conceded that Geology does not demand an unreasonable time for the consolidation of the globe; and if this were so, it would give plausibility to the doctrines of the development of living beings by the agencies of inorganic nature, thoroughly undermine our faith in a Personal Creator, and establish for the Narrative of Creation the very first rank among all human inventions. But the period of the formation of the coal-measures and its duration, and of the fossiliferous rocks, rests not upon the nebular hypothesis, but upon the assumption of a progressive development and extinction of organic beings; and it is now my purpose, in part, to pursue Theoretical Geology into the wreck of mortality, where all its labors and hopes are employed in bringing to light what remains of the past.

The doctrine of "successive creations and extinctions of animals," which originated in Theoretical Geology, has meant nothing more than the present modified phraseology of the development of organic beings by the forces and laws of inorganic nature. But the organization of those beings that were entombed in the rocks anterior to the Flood, and when violent causes, soon after the organization of the globe, were in destructive operation,

is precisely the same as that of the animals of our own times. The condition of physical nature has subsequently improved as it respects certain destructive causes; and if the early period when the forces of nature were in turbulent operation was conducive to the generation of living beings, how shall we explain the abrupt termination of the supposed creative laws of nature after the disappearance of the admitted desolating period, and when all things had become so much more favorable to their supposed generative endowment? (See Chapter VIII. and Appendix I.) The speculatist is silent in the presence of such an appeal to his own premises; or only endeavors to lash the imagination into those absurdities by unceasing, bold, and romantic devices of "a Reign of Insects"—"a Reign of Fishes"—"a Reign of Serpents"—"a Reign of Mastodons, which immediately preceded the Reign of Man"—"the pre-Adamite Man," and by other appeals to the imagination abounding with surprise, which are expected to carry the force of premises, and as if relevant to the subject.* And so this goodly planet is turned over

* The following is a common example of this rhodomontade:

"It was not," says MILLER, in his *Testimony of the Rocks*, "until the earlier ages of the Oolite system had passed away, that *the class of Reptiles* received its FULLEST DEVELOPMENT. And certainly *very wonderful was the development which it then did receive.* Reptiles became everywhere the LORDS AND MASTERS of this lower world. When any class of the air-breathing vertebrates is *very largely developed*, we find it *taking possession* of all the three old terrestrial elements—earth, air, and water." "*Last of all*, the true placental mammals appear. And thus, *tried by the test of perfect reproduction*, the great vertebral division *receives its full development.*" What a contrast with the Mosaic Narrative!

An eminent Geologist and Zoologist has reduced the different "Reigns," which figure in Theoretical Geology, to the following scientific order:

"We distinguish," he says, "four Ages of Nature, comprehending the great geological divisions, namely—1st. *The Primary, or Paleozoic Age*, comprising the Lower Silurian, the Upper Silurian, and the Devonian. During this Age there were no air-breathing animals. The *Fishes were Masters of Creation.* We may, therefore, call it the REIGN OF FISHES. [The "Reign of Insects" being left out.]

"2d. The *Secondary Age*, comprising the Carboniferous Formation, the Trias, the Oolite, and the Cretaceous Formations. This is the epoch in which air-breathing animals first appear. The Reptiles predominate over the other classes, and we may therefore call it the REIGN OF REPTILES.

"3d. The *Tertiary Age*, comprising the Tertiary Formations. During this Age terrestrial mammals, of great size, abound. This is the REIGN OF MAMMALS.

"4th. The *Modern Age*, characterized by the appearance of the most perfect of all created beings. This is the REIGN OF MAN."—AGASSIZ'S *Principles of Zoology.*

as worthless for any other purpose, for millions of ages, to the useless existence of the animal tribes, until Man and Woman—*male* and *female*—happened to be evolved from their brutal predecessors. But with "*the Reign of Man*" comes the only system that can be creditable to its Author; such as every philosophical mind will allow to be necessary to a plan devised by Infinite Wisdom—such a plan, indeed, as man himself would have projected, and therefore, by parity of reason, the supposed fragmentary system of meaningless creations (if *Creation* be ever meant), equally dishonors the wisdom both of God and man. Such, too, was the opinion of one who did not enjoy the light of Revelation. Thus—

"For *what purpose*," says Cicero, "was the fabric of this world constructed? Was it merely for the purpose of *perpetuating* the various species of trees and herbs, which are not endowed even with *sensation? The supposition is absurd.* Or was it for the exclusive use of animals? It is not at all more probable that the Deity would have produced so magnificent a structure for the sake of beings which, though endowed with sensation, possess neither speech nor intelligence. For whom, then, was the world produced? Doubtless, for those beings who are alone endowed with Reason."

But, says Theoretical Geology, animals were created for enjoyment as well as for the uses of man. Certainly, as a subordinate consideration, but surely never for that alone, however brief the time—for this would bear no correspondence with the end of man's existence upon earth. The life of either is so very brief that it would scarcely be worth possessing, even with unalloyed happiness, were there not something of greater moment beyond. This is especially true of animals in their relations to man, whose span of existence, in a large proportion of species, does not reach a dozen years, and there are thousands of species which flourish for a few weeks only; and half of the human race die in infancy and childhood. And what a contrast between the happiness of man and that of animals! What is truly valuable of the former is intellectual, while that of the latter is purely sensual. Sensation forms the only distinction between animals and plants in regard to their obvious designs to subserve the uses of the human race. But there is nothing like the *argumentum ad hominem.*

Is there, then, any one who will affirm that human life would be in the least desirable upon the supposed principle, were it limited to the space of ten years and to mere sensual enjoyments? That is the test—incomparably less severe and appalling than such as has been quoted from the great leaders in the "New Philosophy," Büchner, Spencer, &c. If we apply that test to animals, it will be seen that the hypothesis upon which Geology has rested its final cause of the creation of animals millions of years antecedently to man's creation is a mere fiction; since we may well conclude that what man rejects as absurd upon a question which he may comprehend, the Creator would not have ingrafted upon His designs.

It appears, therefore, that, were human Reason to devise a system of organic life similar to the present, it would not be so untrue to itself as to bring animals into being for the mere object of sensual enjoyment, nor till they could subserve the purposes intended by their existence, and therefore not until man's creation. More especially, it can not be doubted that fundamental principles which are so obvious to man must have governed the Creator in the details of that plan which His wisdom ordained for the benefit of those rational beings whose temporal existence upon earth has mainly a reference to another life of endless duration.

The same philosophy is applicable to the formation of the earth, and declares the fallacy of the imputed experimental system of remodellings for improved adaptations to plants and animals, and its final completion for the better accommodation of man. What would be said of the Architect who, in maturing a plan for a human habitation, should first try his skill upon a barn; but finding, on its completion, that it was suitable only to animals, should demolish the fabric, and then proceed with the same materials to repeat similar experiments till he should have reached the perfected plan which was already in his mind when he began the childish "remodellings?" But thanks to the Mosaic Narrative for the complete exposition of the only system which human reason can recognize as consistent with Infinite Wisdom. It is one stupendous whole—conforming itself not only to the final causes of the earth and its inhabitants in every detail, but to the evidences supplied by the constitution of the globe itself, and by the whole profound philosophy of organic

life. All this, too, I shall have shown beyond the possibility of refutation, because it reposes upon fundamental facts. (See Appendix I.) But I may now say that the occurrence of fossil exuviæ of animals and plants in the lower sedimentary rocks—down in contact with granite—proves that there was no prolonged preparation for their reception, but that the beings which they represent were created as soon as the primary rocks were consolidated.

If such discussions are tedious to some, they are too important to the questions before us to be neglected. The Narratives of Creation and the Flood demand it. The Soul of man and its immortality are deeply concerned in their natural import. If organic beings were slowly introduced upon earth by the forces of inorganic nature, or if not created as represented in the Mosaic Narrative, then has man no Soul and no hereafter. (See Chapter VII.) The advocates of spontaneity of living beings or of any developmental plan call as little, in a general sense, upon a Personal Creator as Laplace in his *Mécanique Céleste;* but the following is too good an example to the contrary to be neglected. It comes from HUGH MILLER, who has put it into his *Old Red Sandstone.* Thus—

"We speak of the infinity of Deity—of His inexhaustible variety of mind; but we speak of it until the idea becomes a piece of mere commonplace in our mouths. It is well to be brought to feel that we ourselves are barren-minded, and that in Him all fullness dwelleth; succeeding creations, each with its myriads of existences, *do not exhaust Him.* He never repeats Himself. The curtain drops at his command over one scene of existence full of wisdom and beauty—it rises again, and all is glorious, wise, and beautiful as before, and all is new. Who can sum up the amount of Wisdom whose record He has written in the rocks—*Wisdom exhibited in the succeeding creations ere man was, but which was exhibited surely not in vain.*" In his *Testimony of the Rocks* he returns to the subject after the following manner: "Such, so far as the Geologist has been able to read the record of his science, has been the course of Creation from the first beginnings upon our planet until the appearance of man. And very wonderful, surely, has that course been! HOW STRANGE A PROCESSION!—that long procession of beings which, starting out of the blank

depths of the by-gone eternity, is still defiling across the stage, and of which we ourselves form some of the passing figures. *Who shall declare the profound meanings* with which these geologic hieroglyphics are charged, or indicate the ULTIMATE GOAL at which the long procession is destined to arrive?"

All this romance for the mere purpose of inculcating Theoretical Geology, under the delusion that the "record of the rocks" magnifies the glory of the Creator! But it may be asked in behalf of common sense, if the originals of the old clam-shells and piscatory exuviæ were not "exhibited in vain," to *whom* was that "beautiful scene of existence exhibited?" It will not be assumed that the "record" is any farther useful than to subserve the purposes of a "Creative Law," and so exclude the Deity from His own work; and before Theoretical Geology can arrive at the "beautiful" objects "*which started out of the blank depths of the by-gone eternity*" there must be a large expenditure of time and gunpowder. No; we have in living nature so much of the evidence of Wisdom and Design, which Theoretical Geology never deigns to consider in contrast with the fossils of the rocks, that the eminent Author of the late *Plurality of Worlds* has considered it abundantly ample, and therefore infers that all beyond is a mere wilderness of waste.

Such is Theoretical Geology; and that the exuviæ of animals and plants are its main foundation, we have the admission of all geologists to the latest day, of whom the following authorities may be taken as examples. Thus, the Rev. Dr. BUCKLAND, in his *Bridgewater Treatise*—

"The study of organic remains (or medals of the rocks) FORMS THE PECULIAR FEATURE OR BASIS of modern geology, and is the *main cause* of the progress this science has made since the commencement of the present century." "We shall find in them the GREAT MASTER-KEY whereby we may unlock the *secret* history of the earth. They are documents which contain the evidences of revolutions and catastrophes long anterior to the creation of the human race." "To attempt an investigation of the structure and revolutions of the earth without applying *minute attention* to the evidences afforded by organic remains, would be *no less absurd* than to undertake to write the history of any ancient people without reference to the documents afforded by their

medals and inscriptions, their monuments, and the ruins of their cities and temples."* "Without the organic remains the proofs of the lapse of such long periods as geology shows to have been occupied in the formation of the strata of the earth would have been comparatively *few* and inconclusive."

The Rev. Professor SEDGWICK, in his preface to a Discourse on the Studies of the University of Cambridge (1850), presents the doctrine of the progression of organic beings as follows:

"There are traces among the old deposits of the earth of an organic progression among the successive forms of life. They are to be seen in the absence of mammalia in the older, and their very rare appearance in the newer secondary groups; in the diffusion of warm-blooded quadrupeds, frequently of unknown genera, in the older tertiary system, and in their great abundance, and frequently of known genera, in the upper portions of the same series; and lastly, in the *recent* appearance of man on the surface of the earth."

And thus, also, Professor Agassiz, in a published letter, dated November 13, 1869—"In some opening remarks of a course on Geology which I am now delivering in the University, I said that the 'Theological interpretation of the Book of Genesis giving six thousand years as the age of the world was a hindrance to the understanding of geological evidence, and no one who started with this idea, and allowed his researches to be influenced by it, could be a [theoretical] geologist.'"

From what, therefore, I have already said of "Successive Creations," of the "Typical System," of "Creation by Law," and of Spontaneous Generation, all of which fall under the developmental plan; and from what remains to be shown of the rapid stratification of the earth in the Appendix on its Organization, and in that upon the Coal Formations, it becomes manifest that the fossil remains are an illusion in their geological application, and that the violent causes which were in operation immediately after the era of Creation interpret the abundance of fossiliferous rocks and their speedy formation. We read of a man who carried in his pocket a specimen-brick to show the character of a

* What, therefore, shall be said of the history of man anterior to Thebes and Nineveh? Where are "their monuments, and the ruins of their cities and temples?" Where shall we look for information? (See Chapter XII.)

house which he was anxious to sell. This would answer sufficiently well for the fossil exuviæ, a single one of which is as good as the whole for imparting information as to the aggregate meaning of all the rest.

It is not to geological pursuits that I raise an objection. On the contrary, inquiries into the structure of the globe are among the most natural to man. It is simply the institution of hypotheses that conflict with Revelation, and not less so with science, to which objections can apply. Where any apparent collision of geological facts with the clear statements of the Mosaic Record may appear to exist, there should be no rash haste to cast them at Revelation, but they should be held in reserve as either wanting in some other facts to disclose their proper import, or, at least, as possibly susceptible of a construction which shall not contradict what the Creator himself has clearly impressed with His authority; or, as in the case of the Deluge, what the Saviour of man has solemnly ratified. This is the rule in all the sciences where the received laws of nature appear to be contradicted. But here ambition has learned its lesson only after a severe experience.

The most distinguishing characteristic of Theoretical Geology, and which has marked its career from the very beginning, is the shifting nature of its fundamental premises, and the vicissitudes and conflicts of hypotheses. HOWARD, in his "History of the Earth and Mankind" (1797), when reviewing this ground, remarks that—

"These pretended testimonies are insomuch more doubtful as their adducers disagree among themselves; and the jarring systems hitherto substituted for the Mosaic Account, so far from according better with the laws of Nature, or being a clearer explication of her past and present state, are generally founded on absurd or ideal hypotheses, and often in direct opposition to the most certain principles hitherto deduced from her."

And such, as I have shown, particularly in Chapter VII., is remarkably true of the present hypotheses of the development of living beings; nor is the nebular theory less opposed to fundamental facts and principles, as will be shown in Appendix I. And now the highest Authority in Geology shall tell us how little confidence is placed in the foundation upon which its pres-

ent speculations repose—"We must not," says Sir Charles Lyell, "too hastily infer, *from the absence of fossil bones of mammalia in the older rocks, that the highest class of vertebrated animals* [the quadrumana] did not exist in the remote ages." This may be also regarded as a summary conclusion from the numerous instances of the highest order of animals whose fossil exuviæ are found in low secondary rocks. It is of course fatal to the whole typical "system," overthrows "the peculiar feature and basis of modern geology," and contradicts Sir Charles's opinion, and as promulgated by many others, that the organization of the earliest geological animals was so far different from the now existing species as to require a condition of physical nature very different from the present. This conflict in fundamental principles grows out of the geological hypotheses of remodellings of the earth, an exalted temperature, and progressive developments of living beings from the lowest to the highest, and a neglect of the foregoing exceptions. It only remains now to discover the bones of man fairly imbedded in deep fossiliferous rocks, or in the coal formations, to complete the *argumentum ad hypothesem;* since Theoretical Geology concedes his comparatively recent appearance upon earth, inasmuch as his exuviæ have not been found in that relation. Such a discovery, therefore, according to the geological hypothesis alone, will establish a corresponding date for the fossiliferous rocks; while, as we have seen, there is ample proof that man's existence upon earth does not exceed the Scripture chronology.

The Rev. Professor HITCHCOCK, in writing upon the General Deluge, has, also, a comprehensive statement, in which he shows the nature of the "Science," in what it consists, and the manner in which it is constructed. It goes with the rest in admonishing us to be satisfied with the facts, and to depend upon the Mosaic Narratives for the scientific principles which they underlie. Thus Dr. Hitchcock—

"Theories of diluvial gravel, like all other ardent generalizations of an advancing science, must be regarded but as the *shifting hypotheses to be modified by every new fact*, till at length they become accordant with all the phenomena of Nature."—*American Bibl. Repos.*, Jan. 7, 1837.

Some time prior to the foregoing, another eminent Geologist,

the Rev. Prof. SEDGWICK, put forth the following admonition; and the reaction which had then commenced was soon followed by the abandonment of the "*Reliquiæ Diluvianæ*" by its Author. Says the Professor—"We [geologists] ought to have paused before we first adopted the diluvian theory, and referred all our old superficial gravel to the action of the Mosaic flood."—*Anniversary Address*, &c., 1831.

Nevertheless, Professor Sedgwick maintained that—"The *Bible instructs us* that man and other living beings have been placed *but a few years upon the earth;* and the physical monuments of the world bear witness to the same truth." But at the same time he made the great mistake of yielding to the geological assumption of the slow formation of the earth, and was thus betrayed into a misstatement of the Mosaic Narrative, in saying that—"Between the first creation of the earth and that day in which it pleased God to place man upon it, *who shall dare to define the interval? On this question* SCRIPTURE IS SILENT." [!]—*Discourse on Studies at Cambridge*, 1834. He has also, in the same Discourse, some very unreserved criticisms upon those writers who attempt geological problems without the requisite knowledge; and of this we have had something from our Author at page 361.

We have seen that Theoretical Geology has proved itself a fabric of speculation by the constant fluctuations of its doctrines, although it has relieved itself of all restraint from Revelation. A late exemplification of this is worthy of note, on account of the eminent source, and the long experience which is sacrificed to a visionary project. Sir CHARLES LYELL, according to Dr. Hooker, in his Address before the British Association for the Advancement of Science (1868), has led a life of geological delusions. Thus Dr. Hooker, the President—

"Sir Charles Lyell, after having devoted whole chapters of the first editions of his *Principles of Geology* to establishing the existence of *special creations*, *abandons it on the tenth*, and this, too, on the showing of *a pupil*" [Mr. Darwin]. "I know of no brighter example of heroism, *of its kind*, than this, of an Author thus abandoning, late in life, a theory which he had for *forty years regarded as one of the foundation-stones of a work* that had given him the highest position attainable among scientific writers:"

"*Dulce et decorum est pro patria mori.*"

But Sir Charles was not quite so abrupt in his transition; for he manifested signs of a predisposition to Darwinism for some time antecedently to the "tenth edition;" and had it not been for his influence, Darwin's work on the "Origin of Species" might have never seen the light; for he states, in his work on the "Antiquity of Man" (1863), that—

"Part of the Manuscript of his projected work was read to Dr. Hooker as early as 1844, and some of the principal results were communicated to me on several occasions. Dr. Hooker and I had repeatedly urged him to publish it *without delay*, but in vain, as he was always unwilling to interrupt the course of his investigations;" and the work did not appear until 1859. Nevertheless (*hæc olim meminisse juvabit*), Sir Charles, after arguing in former days, in his Principles of Geology, against the doctrine of progressive development of living beings from some primordial form, goes on to remark, in regard to the recent appearance of man upon earth, that—

"If the *popular* theory of the successive development of the animal and vegetable world, from the simplest to the most perfect forms, rests on a *very insecure foundation*, it may be asked whether the *recent origin* of man lends any support to the same doctrine, or how far the influence of man may be considered as such a deviation from the analogy of the order of things previously established, as to weaken our confidence in the *uniformity of the course of nature*. I need not dwell on the proofs of the *low* antiquity of our species, for *it is not controverted by any experienced geologist*. Indeed, the real difficulty consists in *tracing back the signs* of man's existence on the earth to that comparatively modern period when species now his contemporaries began to predominate. It is *never pretended* that our race coexisted with the assemblages of animals and plants, of which all or even a great part of the species are extinct."

And yet Sir Charles has become an advocate, not only of the developmental hypothesis, but, as we have seen (Chapter XII.), of the high antiquity of man—forming, indeed, one of the most impressive evidences of the utter instability of Theoretical Geology. It is worthy of remark, also, that Sir Charles has a good analysis of LAMARCK'S doctrine of progressive development, as we have seen in Chapter VIII., which is essentially the same as

Darwin's, and treats it with great severity—designating it as a "violent hypothesis," and regards as absurd Lamarck's notion that—

"A small gelatinous body is transformed into an oak or an ape; passing on at once to the last grand step in the *progressive scheme*, by which an Orang-outang, having been already evolved out of a monad, is made slowly to attain the attributes and dignity of man." "By virtue of the *tendency* of things to *progressive improvement*, the irrational was developed into the rational."

And yet Sir Charles, after "forty years of opposition," has become a convert to exactly those doctrines. And farther, the following summary denunciation of Lamarck's entire theory, and therefore of Darwinism, is as applicable now as when Sir Charles proclaimed it in behalf of Reason; and, in connection with his own metamorphosis, it is a clear demonstration of the utter worthlessness of all such doctrines. Thus Sir Charles—

"It is evident that, if *some well-authenticated facts* could have been adduced to establish *one* complete step in the process of transformation, such as the appearance in individuals descending from a common stock of a sense or organ entirely new, and a complete disappearance of some other enjoyed by their progenitors, time alone might then be supposed sufficient to bring about any amount of metamorphosis. *The gratuitous assumption, therefore, of a point so vital to the theory of transmutation was unpardonable on the part of its advocate.*"—*Principles*, &c.

It will be in vain to urge any difference in principle between Lamarckism and Darwinism. Indeed, we have the direct authority of Sir Charles that he regarded Darwin's doctrine as only a modification of Lamarck's. Thus he says, in his "Antiquity of Man," that—

"The direct bearing of the ape-like character of the Neanderthal [human] skull on Lamarck's doctrine of progressive development and transmutation, or on that *modification of it* by Mr. Darwin, consists in this," &c.

But notwithstanding our Author had opposed the doctrine of development out of a simple primordial condition of organic matter, he has been a thorough advocate of the spontaneity of living beings, and has ascribed their origin to the "Laws of Nature" much after the manner of the DUKE OF ARGYLL. Lamarck, and

Darwin, and Tiedemann, and Spencer, have even the advantage of beginning with some form of organic matter; while Lyell and the Duke necessarily start with the simple elements of matter, which are detached from their inorganic compounds, and gathered together and organized under the influence of the "Laws of Nature." (See Chapters VII. and VIII.) This opinion of Sir Charles is important on account of his high authority in Theoretical Geology, as showing, by its abandonment for another scarcely less absurd, the baseless nature of the geological fabric, independently of our direct demonstrations. (See particularly Chapter VII.) Thus, for example, in our Author's work on the *Principles of Geology*—

"I do not mean to call in question the soundness of the inferences of some botanists as to the *former existence* of certain limited spots whence species of plants have been propagated, radiating, as it were, in all directions from a common centre. On the contrary, I conceive these phenomena to be the *necessary consequences of the plan of nature* before suggested, *operating during the successive mutations of the surface.*"

And as to the development of animals, he says that—"In regard to some of the more modern tertiary periods, the climate of Europe does not appear to have been of such a *tropical* character as may have been *necessary for the development* of the tribe of apes, monkeys, and allied genera." And again—"So far, then, as our present inquiries enable us to judge, there are strong indications that, during the periods of the Wealden, the Oolite, and Lias, there was a large *development* of the reptiles, *at the expense*, as it were, both of the cretaceous and terrestrial mammalia. It may be well, then, to inquire whether this difference in the state of animal life in the northern hemisphere at these remote periods is irreconcilable with the notion of the constancy and uniformity of *the laws which govern* the changes of the organic world."

Our Author's work on Geology abounds with similar examples; and in the following we have one of the numerous instances of the manner in which spontaneity of being, or a development of living beings out of inorganic matter by the laws of nature, has been rendered acceptable under the disguise of a single word—*created*, or *creator;* and of which we have had other

conspicuous examples before us, particularly in Chapter VIII. Thus our Author—

"If the reader should infer, from the facts laid before him in the preceding chapters, that the successive extinctions of animals and plants may be part of the constant and regular course of nature, he will naturally inquire whether there are *any means provided for the repair of these losses?* Is it a part of the *economy of our system* that the habitable globe should, to a certain extent, become depopulated both in the ocean and on the land; or that the variety of species should diminish *until some new era* arrives, when a *new and extraordinary effort of creative energy* is to be displayed?" "Humboldt has characterized these subjects *as among* the MYSTERIES which natural science can not reach; and he observes that the investigation of the *origin of beings* does not belong to zoological or botanical geography. To GEOLOGY, *however*, these *topics do strictly appertain.*"

And again Sir Charles says—"I have endeavored to show that the hypothesis of the gradual extinction of certain animals and plants, and *the successive introduction of* NEW *species*, was quite consistent with all that is known of the EXISTING ECONOMY *of the animate world.*"!!

Our Author's imagination pursues this doctrine of spontaneous generation into its minutest details, far beyond what we have seen of the Duke of Argyll on Creative Law (Chapter VIII.), and which is so entirely estranged not only from the absolute exigencies of the Mosaic doctrine of Creation by a Personal God (see Chapter VII.), but that of creating *altogether*, which is the only one consistent with the Divine Character and Unity of Design, that it should be delivered in its ample force against the fabric of Theoretical Geology. Thus our Author, as to animals—

"It may be safe to assume that, exclusive of the microscopic beings, there are between one and two millions of species now inhabiting the terraqueous globe; so that if only *one* of these were to become *extinct annually*, and *one new one* were to be every year called into being, much more than a *million of years* might be required to bring about a *complete revolution* in organic life."

Our Author even infuses the doctrine of spontaneity of living beings into his work on the "Antiquity of Man." Thus he says—

"While rejecting transmutation, I was equally opposed to the popular theory that creative power *had diminished in energy*, or that it had been in *abeyance* ever since man had entered upon the scene. That a RENOVATING FORCE *which had been in full operation for millions of years should cease to act*, while the causes of extinction were still in full activity, or even intensified by the accession of man's destroying power, seemed to me in the highest degree improbable. The only point on which I doubted was, whether the FORCE might not be intermittent, instead of being, as Lamarck supposed, in ceaseless operation." That is Equivocal or Spontaneous Generation, Pantheism, Atheism, and can mean nothing else. (See Chapters VII. and VIII. for a full demonstration.)

Until quite recently, as we have seen, Sir Charles continued to sustain the "Theory of Progression," or the appearance of animals, in regular order, according to the complexities of organization, from the lowest to the highest, and in equal pace with such as became extinct, in virtue of the "creative law of inorganic nature." He thus defines, in his "Antiquity of Man," the meaning of the geological phrase, "Theory of Progression"—

"It supposes," he says (beginning his exemplification with the vertebrate type), "a *gradual elevation* in grade of the vertebrate type, in the course of ages, from the most simple ichthyic form to that of the placental mammalia, and the coming upon the stage last in the order of time of the most anthropomorphous mammalia, followed by the human race—*this last thus appearing* AN INTEGRAL PART *of the same continuous series* of acts of DEVELOPMENT, one link in the same chain."

As Darwin's doctrine of Natural Selection and Struggle for Existence does not recognize the "Theory of Progression," but inculcates the most accidental development of species out of each other, and in no systematic order, and as it is generally accepted by Geologists, the fossiliferous rocks, and the geological ages that have been founded upon them, must soon become an exploded "Science."

The Rev. Dr. Buckland's abandonment of the Noachian Flood should not be neglected in this connection. After writing a work of great ability, the "*Reliquiæ Diluvianæ*," to prove the occurrence of a general deluge by its desolating effects, he suddenly

abandoned this application of his laborious accumulation of facts, and contributed them towards the foundation of modern Theoretical Geology, which had just taken its stand upon the "Medals of the Rocks." In his *Reliquiæ Diluvianæ* (1823) he says that "The discoveries of modern geology PROVE TO A DEMONSTRATION that there has been a recent *universal* inundation of the earth," and represents it as a violent rush of waters, tearing up the soil to a great depth, excavating valleys, and hurling masses of rocks, gravel, &c., over the face of the earth. And here it will be interesting to recall the principal incidents which led to his sudden rejection of the Mosaic Narrative of the Flood, and to thus appreciate more intelligibly the merits of the substituted hypotheses. It supplies, also, a good illustration of the hasty generalization so common in Theoretical Geology, and of the rapidity with which one hypothesis is abandoned for another, that is soon destined to a similar fate. This is farther conspicuously shown by the substitution of the "Glacial Theory" for the Noachian Flood soon after the events which are described in the following quotation. Indeed, the Glacial Theory was already in an embryo state, and must be regarded as a principal motive for crushing out the Narrative which had been supposed amply sufficient for explaining what the Glacial Theory was ambitious to take upon itself. Here is a sketch of the transition from the Noachian Flood to geological torrents of water, and thence to the glacial theory:

"Influenced by some fresh discoveries," says Phillips, in his Geology, "and the growing importance of the study of *modern* causes in action, some of the eminent Geologists in England dissented totally from the views of Dr. Buckland, and declared, from the *Chair of the Geological Society*, their conviction that the diluvial deposits did not belong to the effects of one general flood."

If we now turn to Dr. Buckland's *Bridgewater Treatise*, we shall see what was the effect of this decision upon the principal projector of the fossil basis of Theoretical Geology, and how readily he abandoned the Sacred Narrative. Thus—

"The evidence which I have collected in my *Reliquiæ Diluvianæ* (1823) shows that one of the last great physical events that have affected the surface of the globe was a VIOLENT INUNDATION, which overwhelmed a great part of the northern hemi-

sphere, and that this event was followed by the *sudden disappearance of a large number of the species of terrestrial quadrupeds.* Discoveries which have been made since the publication of that work show that many of the animals therein described existed during more than one *geological period* preceding the catastrophe by which they were extirpated. *Hence it seems more probable* that the event in question was the *last* of the many geological revolutions that have been produced by *violent irruptions of water rather than the comparatively* TRANQUIL MOVEMENT described in the Inspired Narrative."

About the same time Mr. GREENOUGH, President of the London Geological Society, in his Anniversary Address, 1834, renounced his faith in the Mosaic Flood. He remarked that—

"Some fourteen years ago I advanced an opinion [in his Geology], *founded altogether upon physical and geological considerations*, that the *entire* earth had, at an unknown period, been covered by one *general* but *temporary* deluge. New data have flowed in [the glacial theory], and, with the frankness of one of my predecessors, I also record my recantation."

It is also worthy of notice that Mr. Greenough, in speaking of Whiston's celebrated theory of the Deluge, which refers it to the attraction of the Comet of the supposed period of 575 years, on its passage near the earth, remarks that—

"We need not be deterred from embracing that hypothesis under any apprehension that there is in it any thing extravagant or absurd." ! !—*Geology.*

I mention these things, however, among a multitude of others of a similar nature, for the purpose, mostly, of contrasting "the Science" with the Mosaic Narratives, and of indicating the nature of the former.

And now, considering how little the existing evidences of a universal flood had attracted attention, or were even known, till brought before us by Cuvier, Conybeare, De Luc, and Buckland, it must be regarded as a demonstrative proof of the Inspiration, and of the literal sense of the Narrative which supplies a cause to which recent investigations had referred the universal superficial drift, till Theoretical Geology assigned it to its "last violent irruption of water," and thence to the "Glacial Theory," since the writer himself of the Narrative could have had no knowl-

edge whatever of the facts upon which Theoretical Geology has founded its hypothesis.

In regard to the Narrative of Creation, there were several eminent Divines who wrote upon Geology about the time of Buckland's Bridgewater Treatise, who conceded, for the benefit of Theoretical Geology, as Dr. Buckland expresses it, that—"*Millions of millions of years* may have occupied the indefinite interval between the beginning in which God created the heaven and the earth, and the evening or commencement of the first day of the Mosaic Narrative." They generally left the Six Creative Days to their natural length, and admitted the creation of man and animals as revealed. But the destructive force which was impending over this Narrative rested for a short time only in that long primeval darkness. The absence of light was not congenial to organic life. Different modes of interpreting the fossils found imbedded in the rocks were allowed by Theological writers, according to the mutable speculations of Geologists. They generally placed the creations of the beings which they represent during the darkness of the supposed indefinite period between the "beginning" and the first of the Creative Days. And here it will be interesting, for the purpose of observing more fully the groundwork upon which geological "science" is founded, and some of the extraordinary fluctuations to which it has been rapidly subjected, to look a little farther at its leading premises. The concurrence of some of the principal Clergy appears to have operated as a complete justification of the perversion of the Mosaic Narratives; and to this I have already traced much of the decline of public faith in their Divine communication. It was every thing to Theoretical Geology that the Rev. Dr. Buckland fortified the "long indefinite period of darkness after the first verse" by the "Medals of the Rocks," as he designated the fossils. But others had already opened the way to this license with Revelation; and thence, by an easy transition, to an invasion upon the Mosaic Days of Creation. The Rev. Dr. CHALMERS, for example, allows the long period of darkness, and the most disorderly creations before the geological violations of the Six Creative Days. Here are his words:

"Does Moses ever say that when God created the heavens and the earth, He did more at the time alluded to than transform

them out of previously existing materials? Or does he ever say that there was not an *interval of many ages* betwixt the first act of creation, described in the first verse of the book of Genesis, and said to have been performed in the beginning, and those more detailed operations, the account of which commences in the second verse, and which are described to us as having been performed in so many days? Or, finally, does he ever make us understand that the generations of man went farther than to fix the antiquity of the species, and, of consequence, that *they left the antiquity of the globe a free subject for the speculations* of philosophers." —*Evid. of Christ. Rev., in Edinburgh Encyclopedia.*

But suppose we unite the first and second verses, thus—"In the beginning God created the heaven and the earth. *And* the earth was without form, and *void;* and *darkness* was upon the face of the deep. And the Spirit of God moved upon the face of the waters." What a perplexing embarrassment! Where is the interval?* This authority of the Rev. Dr. has passed into many of the subsequent works on Theoretical Geology; and the "Science" appears to have taken rather an unfair advantage of his accommodating disposition, to which he had yielded under the assurance of a world of living beings anterior to the Mosaic Days. Hear his repentant words. In his *Review of Cuvier's Theory of the Earth*, in *Christian Instructor*, April, 1814, he protests in the following manner against geological liberties with the Bible:

"You [Geologists] protest against the knife and demonstrations of the anatomist as instruments of no authority in your department. We protest against the hammer of the mineralogist and the *reveries* of the geologian as instruments *of no authority* in ours. You think that Cuvier is very slender in geology, and that he has been most unphilosophically rash in *leaving his own province*, and carrying his confident imaginations into a totally different field of inquiry. We can not say that you are very slender in the philosophy of history and historical evidences, *for it is a ground you scarcely ever deign to touch upon.*"

* It is true that attempts have been made, as lately by the Rev. Dr. Molloy, in his Geology, to explain away the force of the copulative conjunction between the first and second verses. But they are even farther strained than in the case of the word *Day*.

Taking, therefore, our Author's own premises, may we not retort them upon himself, and "protest" against the contributions of Theologians to the anti-Scriptural doctrines of Theoretical Geology, as having no more propriety than the interference of the "hammer of the Mineralogist and the reveries of the Geologian" with the province of Divinity?

About the same time Bishop GLIEG (in *Stackhouse's* Bible, 1816), remarks of the fossils, that — "There is nothing in the Sacred Writings *forbidding* us to suppose that they are the ruins of a former earth, deposited in the chaotic mass of which Moses informed us that God formed the present system."

But the Bishop, besides thus *interpolating*, like Dr. Chalmers and many other Divines, upon the silence of Revelation, goes even farther than practical Geologists in advancing the scheme of a prehistoric earth. The Bishop's reasoning, however, is worthy of a place along with what we have seen of the more immediate branches of the "Science." He has also been claimed by Theoretical Geology as a high authority, and his contributions, therefore, go with the rest in disclosing the nature of its foundations.

"We learn," he says, "that after the present heaven and the present earth shall have passed away, a new heaven and a new earth shall succeed them. From this expression we gather that, though after the day of judgment the earth shall cease to be as it now is, the matter of which it is composed shall not be annihilated, but, being arranged into *new order* after a certain duration in chaos, shall give support to a NEW RACE OF INHABITANTS. Reasoning from this, again, *by analogy*, we conclude that it is at least *probable* that *some such occurrence* took place previous to the Mosaic Cosmogony." ! !

Although the Bishop was only a Theological Geologist, and, by his own admissions, derived his information from books alone, he should, nevertheless, have known that a prospective event can have no application in the way of analogy in showing even the possibility of a similar antecedent; while, also, there is no intimation in Scripture of the existence of a former world. Bacon would have given this spurious philosophy a conspicuous place in his *Novum Organum*, had Theoretical Geology advanced as far at that era.

The Bishop has also other arguments of the same prospective analogical nature in behalf of a prehistoric earth; such, for example, as the appearance of new stars which, he thinks, "may be the restoration to order of systems which had formerly been reduced to chaos, and thereby rendered invisible." The distinguished Bishop, however, although yielding much to "Science," protected the literal interpretation of the Mosaic Days "after the first verse," so that his authority has ceased to be useful to Theoretical Geology; and he qualified his remarks in regard to the fossil exuviæ by saying—"If these things be, indeed, well ascertained, of which, however, *I am by no means convinced.*"

The Rev. Prof. BADEN POWELL, in his *Connection of Natural and Divine Truth*, argues in behalf of Theoretical Geology the doctrine of successive developments and extinctions in the following emphatic manner:

"From ill-informed, or too often prejudiced persons, we hear frequent remarks disparaging the inquiries and conclusions of the Geologist, while they allow and applaud the inferences of the Astronomer and the Chemist. Yet when the Geologist contends that the crust of the earth, with its *organized productions, has been gradually brought* into its present condition by a series of creative changes going on through *millions of ages*, his conclusion is condemned as chimerical and dangerous."

But that is not the greatest sacrifice made by this eminent Divine to the cause of Theoretical Geology. Its speculations led him to concede that the Narrative of Creation, including the Fourth Commandment, "Was not intended for an *historical* narrative; and if the representation can not have been designed for *literal history*, it only remains to regard it as having been intended for the *better enforcement* of its objects in the language of *figure* and *poetry* [!], and to allow that the manner in which the Deity was pleased to reveal Himself to the Jews as accomplishing the work of creation was *veiled in the guise* of apologue and parable; and that only a more striking representation of the greatness and majesty of the Divine Power and creative wisdom was intended by embodying the expression of them in the language of *dramatic action.*" !!

The Rev. W. D. CONYBEARE makes a similar sacrifice to Theoretical Geology. He concedes (in *Christian Observer*, 1834), that

"The very numerous successive series of organic remains imbedded in the strata do undoubtedly appear to require periods of considerable duration." But no greater license for perverting the Narrative of Creation, as in the foregoing case of the Rev. Prof. Powell, could be desired than what is granted by our Reverend Author, who says that "It is surely *nowise inconsistent* with the *fullest* reception of Revelation to maintain that it *professedly confines* itself to the exposition of the dispensations of the great Creator, as they concern his final intellectual creation; that, in a word, the Bible is *exclusively the history of the dealings of God towards man.*" That is to say, the Narrative of Creation *speaks only of man;* and as the foregoing remarks refer to that Record, there can scarcely be a greater misapprehension of its statements.

The Rev. Dr. Hitchcock (in *Biblical Recorder*, Jan. 7, 1837) also conceded to Theoretical Geology a long interval after the "beginning," and agrees with the "Science" that the plants and animals of that epoch were differently organized from the present tenants of the earth; as was supposed to be implied by its inexpressible darkness. Thus he says:

"It now appears that the fossil animals and plants *are so different from existing races that they could not have been contemporaries;* so that we must seek in the *undescribed* interval between the 'beginning' and the Six Days' work for the *time when they had their existence*, and regard the Scriptures as entirely silent concerning them, because their history could have no bearing upon the objects of Revelation."

Nay, more—Theoretical Geology addresses itself, in the garb of Religion, to the confiding mind of the child, and carries its misrepresentations of the great facts relative to organic nature into our Primary Schools. Thus the Author last quoted—"COMPARATIVE ANATOMY strengthens this presumption by SHOWING CONCLUSIVELY that most of such animals as now inhabit the globe could not have lived when the same physical conditions existed that WERE NECESSARY for the creatures found in the lower strata."!!—Rev. Dr. HITCHCOCK'S *Elementary Geology*, 1840. A similar statement is made in his Report on the *Geology, Mineralogy, Botany, and Zoology of Massachusetts* (1833), where it is also said of that long period of *darkness*, that, as Moses "leaves untouched an *indefinite period* of what may be called

the semi-chaotic state of the globe, we shall find no difficulty in reconciling any apparent discrepancy. For during this long period all those creations which the strata now reveal may have taken place; and the animals and plants thus brought to light are *of exactly the character which we should expect might exist* IN A SEMI-CHAOTIC *condition* of the globe." !! "During the long period above spoken of the globe was *evidently* preparing for the residence of Man, and the other animals that now inhabit it."

Such is an exact representation of the knowledge of Theoretical Geology respecting comparative anatomy and of the exigencies of light to vegetation, till the late day when the discovery of the *eyes* of the Trilobite ("the first of created animals") led to an immediate abandonment of the long period of darkness, and an assault upon the Six Creative Days.* But ignorance of organic life should be no pretext for ingrafting error upon Revelation, nor for violations of natural laws, and least of all for imputing absurdities to the Almighty in opposition to His explicit statements.

At another time the Author just quoted virtually concedes the want of any just foundation for the doctrine of progressive development, whether in light or darkness, by attempting to sustain it by the most shallow of all hypotheses: "Suppose now," he says, "that Naturalists should find reason to conclude that new species of animals and plants do occasionally appear on the globe; would there be any inconsistency between such a *fact* and the Scriptures?"—HITCHCOCK, *in Biblical Recorder*, January, 1838.

* The Rev. Dr. BUCKLAND was one of the first to recognize, in the Eyes of the Trilobite, the existence of light at the very dawn of Creation. As the discovery forms a very important crisis in Theoretical Geology and the Narrative of Creation, the reader will be interested with its history:

"We must regard the *eyes* of the Trilobite," says the Rev. Dr. BUCKLAND, in his Geology, "*with feelings of no ordinary kind*, when we recollect that we have before us the identical instruments of vision through which the *light of heaven* was admitted to the sensorium of some of the *first created* inhabitants of our planet. The discovery of such instruments in so perfect a state of preservation is one of the *most marvellous facts* yet disclosed by geological researches; and the structure of these eyes supplies an argument of high importance *in connecting together the extreme points of the animal creation.*" "We do not find this instrument passing onward through a series of *experimental changes* from more *simple into more complete forms.* It was created *at the very first in the fullness of perfect adaptation* to the uses and conditions of the class of creatures to which this kind of eye *has ever been, and is still appropriate.*"

But the abandonment of the long period of darkness, and the subsequent invasion upon the Six Creative Days, has not modified the anatomical and physiological doctrines of Theoretical Geology. It continues to equally warp them to its assumptions of "remodellings of the earth," "an universal tropical temperature," "progressive developments," &c. Sir CHARLES LYELL, as we have seen, presents the existing aspect of geological philosophy; and here is more from his work on the Principles, &c.:

"As Geologists, we learn that it is not only the present condition of the globe which has been suited to the accommodation of myriads of living creatures, but that *many former states also have been adapted to the organization and habits of prior races of beings.* The species, likewise, have changed; and yet they have all been so modelled on *types analogous* to those of existing plants and animals *as to indicate throughout a perfect harmony of design and unity of purpose.*"

The quotation shows, also, how a writer will contradict himself in the same sentence when he attempts to mingle the true with the false, since, if the present animals and plants are so similar to the most ancient "*as to indicate throughout* a PERFECT HARMONY *of Design and Unity of Purpose*," nothing can be more inconsistent than to assume that "*many former states of the globe* [by which is meant different physical conditions] *have been adapted to the organization and habits of prior races of beings.*"

Strangely enough, the foregoing paragraph is a part of our Author's short defense against a charge of atheism alleged by "a friendly Critic;" and how far he has averted this imputation will appear more clearly from the following remarks, in the same connection. Thus, as to "the past eternity of our planet"—

"It has also been urged that, as we admit the creation of man to have occurred at a comparatively modern epoch—*as we concede the astonishing fact of the first introduction of a moral and intellectual being*—so, also, we may conceive *the first creation of the planet itself.* I am far from denying the weight of this reasoning from analogy; but although it may strengthen our conviction that the present system of change has not gone on from eternity, it can not warrant us in presuming that *we shall be permitted to behold the signs of the earth's origin*, or the evidences of the first introduction into it of organic beings."

However innocent our Author may be of the charge of his "friendly Critic," that "the existing causes of change have operated with absolute uniformity from all eternity" (*Quarterly Review*, 1830), it can not be doubted that the manner of presenting the defense is calculated to instill the belief that the universal world is self-existent.

In regard to our late reference to Comparative Anatomy, it should be said to the uninformed that it makes no distinction whatever between the animals and plants entombed in the lowest fossiliferous rocks and the analogous species of the present day, and that the former assure us that external nature in its relations to life was the same at the first appearance of living beings as at this nineteenth century. The assumptions to the contrary are in the highest degree discreditable to "the Science." (See Chapter VII.) But what settles the question is the present existence of animals and plants of the highest organization, that have descended from such as were supposed to have been extinct, and whose exuviæ are among the earliest "medals of the rocks;" and, what is very remarkable, Sir Charles Lyell, as we shall have seen, records the fact. But Theoretical Geology defies the fact even when announcing it. Thus, the Rev. Dr. Buckland, in his Bridgewater Treatise on Geology (1836)—

"With respect to the state of animal life during the deposition of the secondary strata, the condition of the globe seems not yet to have been sufficiently advanced in tranquillity to admit of *general occupation* by warm-blooded terrestrial Mammalia. The only terrestrial Mammalia yet discovered in any secondary stratum are the small marsupial quadrupeds allied to the Opossum."

These marsupial quadrupeds, however, had not others been discovered under similar conditions, as we shall soon see there have been, are abundantly sufficient to demonstrate the fallacy of the whole geological hypothesis which has been arrayed against Organic Nature and the Narrative of Creation. And here is a fact from Sir Charles Lyell in his late work on the Antiquity of Man (1863), which goes with the rest in showing the fallacy of the "Theory of Progression," and therefore of the "Creative Law," and the worthless nature of "the basis" of Theoretical Geology. Thus—

"As to the class Reptilia, some of the *orders* which prevailed

when the *secondary* rocks were formed are *confessedly much higher in their organization than any of the same class now living.*" And again—"For more than thirty-four years it has been a received opinion in palæontology, that Reptiles had never existed before the Permian or Magnesian limestone period, when at length, in 1844, *this supposed* barrier was thrown down, and CARBONIFEROUS Reptiles, *terrestrial* and *aquatic*, of *several genera*, were brought to light."

As all such information is suppressed by late popular writers on Geology, the inquisitive reader will be interested with knowing still farther the different phases of hopes and fears which have distinguished the speculations upon this momentous subject within a few late years. Thus Brongniart says:

"No one plant has been discovered in the *transition rocks*, and to which it is *peculiar*, that differs much from those found in the later series."—*Tableau des Terrains*, p. 291.

And here is one of the ablest of the school: "The former opinion," he says, "that the early animals were exclusively simple in their structure appears, therefore, no longer tenable."—Professor SILLIMAN'S *Appendix to Bakewell's Geology*, 1839.

But the fossils would amount to nothing without assuming a succession of developments and extinctions, and it is hard to abandon them entirely; so, therefore, we are told by the same Authority, that—

"As creation advanced, *higher* orders of both animals and plants were called into being, while animals of *simple structure* are also continued to the present time. There was not, however, an *entire* extinction of *all* the animals of a particular race," &c.

BAKEWELL concedes that "The evidence from organic remains alone must ever be attended with uncertainty unless originally confirmed *by superposition.* Animals whose remains are deposited in distant basins may be of different species; but this does not prove that they did not live at the same period." "When the different periods of time *shall be known* in which different species of animals first appeared in different latitudes, then, and *not till then*, can we predicate with certainty respecting *the relative age of strata* from their organic remains alone."—*Geology.*

Our able Author has also occasional remarks in which he harmonizes with the Mosaic Narrative, as in the following quotation; where will be seen also a discrepancy of opinion in Theoretical Geology upon the important subject before us, and that we adopt exactly the conclusions of our Author, who is reasoning altogether against us. Thus, while employed in advocating the progressive development of animals, and remodellings of the globe, our Author reasons like ourselves:

"Even those Geologists," he says, "who deny the *progressive development* of organic life admit that man is a recent inhabitant of the globe; but if, as they maintain, the essential conditions of the earth have been the same as at present during an indefinite series of ages; if the same causes have always been in operation, without any increased intensity of action; if the earth *from the remotest imaginable epoch* had islands and continents, rivers and seas, enjoying a similar temperature to the present, though placed in different latitudes; if such, I repeat, were from *the remotest epoch* the condition of the globe, *no assignable reason can be imagined why it might not have been inhabited by man.*"

To which I may add that, when the earth was adapted to the growth of plants, the laws which govern vegetation, and its physical agencies, assure us that the earth was then as well qualified for the abode of man and animals, and incomparably more so in the temperate climates than it is at this day in the arctic regions; nor can this affirmation be in the least degree invalidated. It is founded upon immutable facts and principles, and is alone subversive of the whole fabric of Theoretical Geology. When the Science shall understand the intimate relations between plants and animals in respect to their physiological conditions, and the close analogies which obtain as to physical agencies among all the members of the organic world, it will accede to the foregoing statement as readily as it did to the necessity of *light* to the earliest of animated beings on its discovery of the eyes of the Trilobite (p. 436).

Another important fact, besides the multitude we have had before us, and others which will be urged, may be now stated as remarkably corroborative of the Mosaic Narrative, and such as is demanded by Divine consistency, that there has been but one Creation, and that one simultaneous throughout the Organic

world. It is thus represented by Sir Charles Lyell in his Principles of Geology:

"From the remotest period there has been a coming in of new organic forms, and an extinction of those which pre-existed on the earth; some species having endured for a longer, others for a shorter time; while *none have reappeared after once dying out.*"

Now, in view of the multitude of species that have become extinct, and the greater number of analogous ones that still exist, it is sufficiently manifest that if there were any foundation for the creative law of nature, a solitary one, at least, of the extinct species should have reappeared. (See Chapter VII.)

HUGH MILLER admitted the usual geological developments and extinctions, but was just in time to escape "the ruins of a former earth" which was supposed to have existed "between the first and second verses of the Narrative of Creation." In his *Testimony of the Rocks*, he says that "The *scheme* of reconciliation with the Narrative of Creation, which was *perfectly* adequate in 1814 [and in 1837], was found in 1839 to be no longer so." But great innovations have been subsequently made, so far as it respects the doctrine of developments and extinctions. There are however, some who dissent from the usual hypotheses. Thus the distinguished Professor Dana, of Yale College, in the *Bibliotheca Sacra*, 1856, maintained the doctrine of distinct and progressive creations, but regards the "typical plan" as *extinct*, and thus demolishes the fundamental basis of Theoretical Geology.

"Species," he says, "have not been made out of species by any process of growth or development, for the transition forms do not occur; the evolution or plan of progress was by successive creations of species, in their full perfection. After every *evolution*, no imperfect or half-made forms occur; no back step in creation, but a step forward, through new forms, more elevated, *in general*, than those of earlier times; the Creation was not in a *lineal series* from the very lowest upward. *The types are wholly independent*, and are not connected *lineally*, either historically or zoologically. The *earliest* species of a class were often far from the very lowest, although among the inferior. In many cases the original or earliest group was but little inferior to those of later date," &c.

The scene is thus continually and rapidly shifting, and is equiv-

alent to an open avowal that the Scripture text is a worthless document, and is tolerated only till mankind shall become a little more accustomed to the shifts of Geology. Even the Rev. Dr. THOMPSON concedes, in his *Man in Genesis and in Geology*, that "the Science" is unreliable in its Divine relations. He remarks, that—

"The history of Professor OWEN'S opinions illustrates the instability of scientific theories. Since the publication of his 'Palæontology' he has openly shifted his ground upon the doctrine of *specific creation by the intervention of miraculous power*. His *reasons for reversing* his judgment upon this point *appear plausible*, but no more so than were his earlier arguments upon the other side."

We have seen that, to expound the origin of species by natural laws, millions of years are now substituted for the Creative Days. What a contrast is here between the budding of the invasions upon the Sacred Record and the full-blown revolution! All the disciples of the school were for a while contented with the first step in "accommodating the Narrative to geological facts." Having imagined a *hiatus* "between the first and second verses," they ventured upon assigning the organization of the earth, and a long succession of developments and extinctions of plants and animals, to the mystical agencies of that "long, indefinite period of darkness," and were generally opposed to any encroachment upon the natural meaning of the SIX DAYS OF CREATION. "It is only a little sin, and my soul shall live." But like the habit which renders us insensible to greater ones, so have the perversions of the Narratives of Creation and the Flood advanced till their near obliteration is received by multitudes with absolute insensibility. Dr. Buckland, as we have seen, began to suspect that the exigencies in Theoretical Geology would not be satisfied with the long "undefined period of darkness," and, besides his commentary on the eyes of the Trilobite (p. 436), has many ingenious remarks preparatory to its approaching abandonment, and finally concludes with saying that—

"Still, there is, I believe, no sound critical or theological objection to the interpretation of the word *Day* as merely *a long period;* but there will be *no necessity* for such an extension in order to reconcile the text of Genesis with physical appearances,

if it can be shown that the *time* indicated by the phenomena of Geology may be found in the *undefined* interval following the announcement of the first verse."—*Bridgewater Treatise on Geology.*

Here we have one of the earliest intimations of a serious design to extend the Mosaic Days beyond their obvious meaning; not that there is any thing in the language of the Record to justify the perversion, but simply because it may be necessary to accommodate it to geological speculations. Indeed, it is amusing to observe the doubts and qualifications and labored efforts upon the word יום (*yom*), with which the Creative Days were abandoned to Theoretical Geology. All restraint, however, has now disappeared, although YOM continues to be a perplexing word, and of elaborate management, as, for example, in the work by the Rev. Dr. MOLLOY (Professor in the Royal College of St. Patrick), on Geology and Revelation (1870). A helping hand is thus, and in other ways, freely extended. The Reverend Author just referred to, who grants all that Theoretical Geology can desire, contributes to "the Science" the following amendment of the Narrative of Creation:

"We freely admit," he says, "that the hypothesis we have been defending would be of little use to account for geological phenomena, if it did not include the *existence of light* during the period of indefinite duration which we suppose to have *elapsed between the first creation of the world and the work of the Six Days.* But in truth *there is no difficulty* in supposing that during such an interval *Light* may have prevailed upon the earth, and *Air*, and *all the other conditions* of organic life, pretty much as they do at the present day. Afterwards, at the close of the period, when perhaps ages innumerable had rolled by, this planet of ours would have appeared in that condition which is described in the second verse. Then the command of God would have gone forth —'Let there be *light;*' and at once *darkness* would have been dispelled, a *new era of existence* commenced," and so on; being something after the manner of Bishop Glieg (p. 433).

It will be useful to observe, for a moment, a very common method of preparing the way for any perversions of the Narrative of Creation, and for the introduction of which Theoretical Geology is much indebted to the Rev. Dr. BUCKLAND, who, in his Bridgewater Treatise on Geology, remarks that—

"After all, it should be recollected that the question is not respecting the correctness of the Mosaic Narrative, but of our interpretation of it; and still further should it be borne in mind that the object of this account was not to state *in what manner, but by whom* the world was made."

Here, then, we find a *platform* early laid down by an eminent divine for employing the Narrative of Creation in any way that may suit the purposes of Theoretical Geology, so only a Creator be allowed to have been the Author of Nature. But the foregoing representation of the Narrative should not be left without comment. Our Author, and his long line of followers, should not be permitted to enjoy the advantages of his foregone conclusion, that "it was not an object of the account to state in what manner the world was made." On the contrary, as I shall have shown, it is everywhere just the contrary of this, and with an astonishing precision of detail. But let us now have a more specific method of demonstration. Is there nothing more, for example, conveyed by the expression—"And God said, Let there be light, and there was light"—than that God was the Creator of light? Does not the statement tell of the "manner," as well as "by whom," light was created? Does it not tell us that it was not an emanation from chaos, no "correlation of forces" already in being, no chemical product, no mere "mode of motion," nor produced in any sense after the manner of man? Does it not inform us of the manner of man's creation, of the materials, &c., and that a modified plan was pursued in regard to woman, and a reason assigned for the difference? and do we not here find the only "scientific" account which can possibly be rendered of the institution for the propagation of the species, and the only ground for the marriage relation? Is there nothing of the "manner" about the endowment of the body with a Principle of Life and a Soul? And so of the creation of plants before they were in the earth, and the reasons assigned for so doing—the "mist that went up and watered *the whole face* of the ground" for the benefit of those created plants—the seeds that were also simultaneously placed in the ground, and, as we shall see, in wonderful harmony with the exigencies of the occasion—the creation of man and all the animal tribes out of the dust of the earth, &c. Is there nothing about all this that speaks of "the manner" of creating all things about

which man has any special interest, and in language best adapted to the general understanding of the human race? Can Theoretical Geology imagine that a more intelligible account of "the manner" could have been rendered by the Almighty himself? Equally, also, must it be allowed that every other specification in the Narrative is more perfectly imbued with "the manner" of the Creative Acts than can be conveyed by any modification of its language; and this consideration forms a strong internal proof that the Record was divinely communicated, and intended to be received in its obvious meaning. Had the Narrative of Creation no other object than to state "by whom the world was made," such an object would have been accomplished by the statement in the first verse. And yet our Reverend Author, while thus employed in opening the way for Theoretical Geology, expresses exactly our own conclusions in the following manner; and I shall therefore, quote extensively. This may be tedious to some, but it is necessary to a proper understanding of our subject.

"The disappointment of those," says our Author, "who look for a detailed account of geological phenomena in the Bible rests on a gratuitous expectation of finding therein historical information respecting *all the operations of the Creator in times and places* with which the human race *has no concern.* As reasonably might we object that the Mosaic History is imperfect because it makes no specific mention of the satellites of Jupiter or of the rings of Saturn. We may fairly ask of those persons who consider physical science a fit subject for Revelation what point they can imagine, short of a communication of Omniscience, at which such a Revelation might have stopped, without imperfections of omission, less in degree, but similar in kind to that which they impute to the existing Narrative of Moses. A revelation of so much only of Astronomy as was known to Copernicus would have seemed imperfect after the discoveries of Newton, and a revelation of the science of Newton would have appeared defective to Laplace. A revelation of all the chemical knowledge of the eighteenth century would have been as deficient in comparison with the information of the present day, as what is now known in this science will appear before the termination of another age. In the whole circle of the sciences there is not one to which this argument may not be extended, until we should require from

Revelation a full development of all the mysterious agencies that uphold the mechanism of the material world."

The exclusion of all the foregoing details from the Narrative of Creation, and its limitation to the great facts which form the basis of all the sciences, is one of the best proofs of its Divine origin; nor can there be detected in any part of the Narrative, as I shall have shown, a single statement in conflict with the details of any science—for Geology is nothing but an assemblage of facts, and, as will appear, in harmony with the plain statements of the Narrative. When we come to an analysis of the *order* of Creation alone, without regarding the other internal proof of its Divine origin, we are amazed at the scientific harmony and Unity of Design that pervades the whole—each great system arranged by itself, and in that exact order which science demands, but which science could not have determined till a recent day. How obvious, then, that the writer, unless recording the events exactly as delivered, and by one only Being who could have imparted the knowledge, would have confounded more or less the distinct systems—such as bringing together the creation of plants and animals, or transposing the order; and a single transposition would have justified Theoretical Geology in all its invasions. Can a like perfection be affirmed of any other production in which the sciences are equally involved? I shall have shown that no human invention of the same complicated nature could withstand the ordeal of science. This, indeed, is sufficiently denoted by the manner in which Science has attempted to impugn the Narrative; and had it been in conformity with the teachings of Theoretical Geology, it would have everywhere violated the established facts and principles of Anatomy, Physiology, Chemistry, and Astronomy.

The object of the Author last quoted, in representing the Narrative as exempt from superfluities, was to supply a justification to Theoretical Geology in assuming successive developments of animals and plants, remodellings of the earth, &c., through millions of ages, because the Narrative does not say that there had not been developments of living beings antecedently to the Mosaic Days, nor inform us about the fossils of the rocks, nor specify the number of hours of which the Mosaic Days consisted. As to the fossils, upon which Theoretical Geology has reared its

fabric, had the Narrative made any reference to them, it would have seriously violated the whole consistency of its plan. Those fossils form an integral part of what is affirmed as to the creation of animals and plants; and there would have been just as much propriety in describing all the species after having stated the general fact of their creation.

It can not, however, be doubted that, had the Creator devised the incongruous and unmeaning system imputed to him by Theoretical Geology (so far as such a Being is supposed to be responsible for it, or to have had any connection with the History of Creation), He would have given some intimation of the fact when employed in dictating the history. It would, of course, have been within Divine knowledge that man would have had the same, if not greater, curiosity about the *experimental types* with which he is so intimately associated in organization and habits—far greater, indeed, than would be his interest in the separation of the dry land from the water—and that in process of time he would come to observe those "records," or "medals," as Geology has it, in the bosom of his planet, and that, if the Narrative were really deficient as it respects these "elementary types" of the human race, and of the present animals and plants, for whom they are said to have served as "models," skepticism and infidelity would justly follow. And how truly is all this illustrated by Theoretical Geology! As these premises, therefore, can not be invalidated, it follows conclusively, from the silence of the Record as to any creations antecedently to the Mosaic, that there had been none to reveal, and that the assumption, therefore, is anti-Scriptural. Indeed, as the Narrative professes that there was but one creation of living beings, had the Writer known that evidences of an antecedent creation were mingled with the latest, it would have been an act of deception, not only to have concealed a fact of such immediate interest to mankind, but to have conveyed the belief that there had been one creation only. It is evident, therefore, that the greatest of all the invasions upon Revelation is that of employing the reasonable silence of an inspired writer upon topics relative to the events which he relates, for the purpose of discrediting his direct statements.

It was prophetically said of the accommodating schemes of Dr. BUCKLAND by an able contemporary, the Rev. JOHN FLEMING

(whom the Rev. Dr. HITCHCOCK taunts, in the *American Biblical Repository*, January, 1837, with "an excitement of feeling"), that—

"If the geological creed of Professor Buckland be established as true in Science, then must the Book of Genesis be blotted out of the Book of Inspiration."

This, however, is not within the range of possibilities. The Narrative of Creation has provided against such a contingency by its own irresistible proof of its immediate and verbal Revelation by the Creator. Our interest lies, therefore, in protecting the ignorant, or credulous, or indifferent, against the anti-Scriptural doctrines. The Bible will take care of itself.

In the present chapter, and also in the eleventh, I have introduced many distinguished Theological Authorities in behalf of the encroachments upon the Narrative of Creation by Theoretical Geology. The citations might be readily multiplied, and more willing advocates, like Bishop COLENSO, could be introduced. But such as have been before us are sufficient to explain the unreserved disposition which has been made of the Narratives of Creation and the Flood, and its final culmination, at the Meeting of the British Association for the Advancement of Science in 1870, in the "emancipation of Science from Theology" (page 353). And here it is refreshing to avail myself of information embraced in an article by the Rev. Dr. JOHN HALL, which appeared in the New York EVANGELIST of December 16, 1869. The Rev. Dr. thus approaches Theoretical Geology with a weapon of its own providing in his hands:

"It has been assumed by Geologists that chalk formation is altogether a thing of the past, and necessarily implies time, as well as a temperature widely remote from those of the sandstone formation. Put two surfaces—sandstone and chalk—together, and your Geologist will tell you that both were under the sea, and that they were formed at periods enormously remote. But these gentlemen tell us that the formation of both is going on at this present time, side by side, in spots of ten miles' width, and that, could we lift into upper air a section of such sea-bottom today, geologists would be bound on all the principles they have counted settled, to pronounce one part *immensely older* than the other, though they were both *in course of formation*, side by side,

yesterday. Accordingly, it is reported to the Royal Society within the last month—'Wherever similar conditions are found upon the dry land of the present day, it had been supposed that the high and the low temperature, the formation of chalk and the formation of sandstone, must have been separated from each other by long periods, and the discovery that they may actually coexist upon adjacent surfaces *has done no less than strike at the very root of many of the customary assumptions* with regard to *geological time.*' Just so, LYELL'S Uniformitarian theory has been consigned to the *receptacle of dishonest weights and measures*, if there be, as there ought to be, a *limbus* for such. And now another accepted standard *is branded as worthless*, or *worse.* Let us hope the modesty of all *true science* will be promoted by these discoveries.

"It used to be accepted as settled that animal life in the sea ceased at a depth of three hundred fathoms. Mr. James Forbes, indeed, counted upon finding it lower, on a scale proportioned in some degree to the decrease of life with increasing height of land. But last summer H. M. S. *Porcupine* carried out a series of investigations with dredging apparatus never before equalled, and which searched the sea-bottom surface five hundred fathoms deeper than that from which the first Atlantic cable was fished up. The dredge, weighing nine or ten hundred pounds, was worked to the depth of 2435 fathoms, and found 'an extraordinary abundance of animal life at the bottom of even the deepest ocean abysses.' 'Creatures of *high organization, with perfect eyes,*' mollusks of over a hundred species, silicious sponges, annilids and crustaceans are there, and endless 'animal life actively engaged in chalk formation,' not having the fear of the Geologists before their eyes! If Mr. Barnum offered to the American public a living Mammoth; or if a Plesiosaurus appeared in Broadway, there are many persons competent to show, on *scientific* grounds, that neither had any business to be there, the last of the race having died and been buried in glacial deposits, or otherwise, many millenniums ago. So it had been established regarding a pretty little Crinoid (stone-lily), of which you may see engravings in books on *Palæontology*, and of which the last representative, called by the name of *Bourgueticrinus*, disappeared among the chalk masses in the days when oolite was being

made. But, behold! M. Sars, a Swedish explorer, brings up a living specimen of this class. Many thanks to the little chalk-maker! It led to further searching, to deeper dredging, and let us hope also to deeper thinking. It shows that 'there are more things' in the sea, at least, than Geology has dreamed of; it shows that science may be all wrong when it thinks itself most right; and that it is no wisdom, but *consummate folly*, to bate one jot of our confidence in Inspired Writ because scientific men insinuate its unreliableness, and suggest, with a pile of ill-classified fossils before them, that the tables of stone contradict the Record that claims the inspiration of God."

A highly interesting account, by Dr. Wm. B. Carpenter, of the recent deep-sea explorations by the British "Lightning" and "Porcupine" expeditions, read before the "Royal Institution of Great Britain" (February 11, 1870), enlarges our knowledge of animal life as it exists in abundance at the depth of three miles, and at a temperature of 2½° Fahr. below the freezing-point of fresh water, and under a pressure of nearly three tons for every square inch. But the discovery which now interests us is the following:

"The dredging operations have added largely to the number of cases in which *types* that had been regarded as *characteristic of earlier geological periods, and to have been long since extinct, prove to be still existing in the depths of the ocean* [as I ventured to predict in my former work on "Theoretical Geology"]; and greatly increase the probability that an extension of the like method of research to more distant localities would produce even more remarkable revelations of this character."

The application of the foregoing discoveries to the fossiliferous rocks and to the whole "typical system of successive developments and extinctions" is obvious enough, and will render service when I come to the interpretation of the earthy strata in the coal-formations in Appendix III.

In my "*Theoretical Geology*," 1856, occurs the following remark upon the subject now before us: "The narrow researches of Geologists, especially as it regards the ocean, in no respect qualify them to pronounce the extinction of even a comparatively few of the animal or vegetable tribes. This is conspicuously shown in the inability of Botanists, who are more indefatigable

than Geologists, to ascertain the sources of many things which are open to observation throughout extensive regions of the earth. The tree which produces *myrrh*, a substance in universal use, mentioned in the Old Testament, and an article of commerce more than 3500 years ago, remained unknown till a single specimen was obtained in 1825. The true *asafœtida* plant, although its gum-resin has been in use for many centuries, has been only lately ascertained. Nothing is known of the plant yielding *sagapenum*, although its gum-resin has belonged to the Materia Medica ever since the days of Hippocrates. The same is also true of *galbanum* and the plant which yields it. *Colombo*, a vegetable tonic in general use and high esteem for nearly two centuries, was supposed to come from Colombo, in Ceylon, till 1830, when Dr. Hooker ascertained that it is the produce of Mozambique, at an opposite point of the earth. But I will not multiply these examples. They are sufficient to show how lean must be the researches of Geologists under the ocean and beneath the surface of the earth." Sir Charles Lyell, and other Geologists, as we have seen, and shall continue to see, abound with admissions to this effect. Here is one from Lyell very apposite to our present purpose. Thus—

"I shall simply express my own conviction that we *are still on the mere threshold of our inquiries*, and that, as in the last fifty years, so in the next half century, we shall be called upon *repeatedly to modify our first opinions* respecting the range *in time* of the various classes of fossil vertebrata. It would, therefore, be *premature to generalize at present* on the NON-EXISTENCE, OR EVEN THE SCARCITY OF VERTEBRATA, *whether terrestrial or aquatic, at periods of high antiquity, as the Silurian and Cambrian*"—which are the oldest fossiliferous rocks, and include the *Trilobite* (p. 436).—LYELL'S *Elementary Geology*, 1851. And again he says, still forgetting himself—"If doubts and obscurities still remain, they should be ascribed to our limited acquaintance with the laws of Nature, *not to revolutions in her economy*. They should stimulate us to further researches, not tempt us to indulge our fancies in *framing imaginary systems for the government of infant worlds*."—*Principles of Geology*.

It is stated by Dr. MANTELL that an Indian arrow-head was found beneath the leg-bones of the skeleton of the Mastodon

Ohiensis or Giganteus, now in the British Museum, and four similar weapons were imbedded in the same stratum. If this statement be reliable, it would divest Theoretical Geology of one of its important proofs of the high antiquity of man, since these arrow-heads are clearly the work of the ancestors of the present North American Indians. (See Chapter XII.) But the Virginia specimen, with its stomach preserved and filled with plants like those growing around it, and protruding above the surface of the ground, is equivalent to a living specimen, and has not yet received its proper consideration, either from Theoretical Geology or from the Showman of scarcely less notoriety and delusive assumptions, to whom Dr. Hall refers in the foregoing quotation. But more than that, and not less disregarded by Theoretical Geology, it is stated by the eminent Geologist, BAKEWELL, that—

"We have remains of the Elephant (existing species) occurring in a formation *more ancient* than the age of the Mastodons. Such instances should lead us to receive the evidence from animal remains alone *with great caution.* Indeed, there is good reason to believe that in North America *the age of the Mastodons* was continued to nearly the present epoch, if the animal be not still living in some of the unexplored recesses of that vast continent." Sir CHARLES LYELL also remarks, in his *Antiquity of Man*, that —"We can scarcely doubt that the Mastodon in North America lived down to a period when the Mammoth *coexisted* with Man in Europe," and from which, in part, he infers the antiquity of the human race. (Chapter XII.)

Again, Dr. BUCKLAND remarks, in his *Bridgewater Geology*, that—"Discoveries demonstrate *the constancy of the laws of coexistence that have ever pervaded all animated nature*, and place these extinct genera in close connection with the living orders of Mammalia." In exemplification of this coexistence, he states that extinct genera of Pachydermata, such as the Palæotherium, Anoplotherium, &c., are found in the gypsum of the Paris basin along with those of the existing genera of carnivorous, marsupial, rodential, and reptilian animals.

And thus, also, HUGH MILLER, in his *Testimony of the Rocks*—"Although the Northern Mammoth, the Northern Hippopotamus, two Northern species of Rhinoceros, the Cave-hyena, the Cave-

tiger, and the Cave-bear, have all ceased to exist, we know that the *descendants* of some of their *feebler contemporaries*, such as the Badger, the Fox, the Wild-cat, and the red Deer, still live amidst our hills and brakes. And for many ages must those extinct animals and the old extinct Elephant have roamed amidst our own familiar trees." "Of a still more ancient period, represented by the Red Crag, *seventy out of every hundred* species of shells *still exist*."

Now I reiterate that any one of the foregoing exceptions to the geological order of developments and extinctions (and, as will be seen, there are many others that go back to the earliest fossiliferous rocks) is sufficient to overturn the whole geological fabric; and this, too, upon the ground of its own admitted basis. Sir CHARLES LYELL, and other Geologists, as we have seen, bear testimony to the same facts. And it is this accumulation of proof derived from Theoretical Geology which seems to be necessary to overpower the assumptions by which it is so entirely regardless of the contradictory facts. Here, also, is an interesting item from HUGH MILLER, which looks like some correspondence with the Mosaic Narrative of Creation:

"It is a *great fact now fully established* in the course of geological discovery, that *between* the plants which in the *present time* cover the earth, and the animals *which inhabit it*, and the animals and plants of the later *extinct* creations, there occurred *no break or blank*, but that, on the contrary, *many of the existing organisms were contemporary* during the morning of their being *with many of the extinct* ones during the evening of theirs. We know, further, that several, even of the wild animals which continue to survive amidst our tracts of hill and forest, *were in existence* MANY AGES ERE THE HUMAN RACE BEGAN."

Here is another statement by Buckland, which is all that can be desired in defense of our position: "It appears," he says, "that the Coniferæ *are common to* fossiliferous strata of *all periods*. They are least abundant in the Transition series, more common in Secondary, and most frequent in the Tertiary series. Hence we learn that there has been *no time since the commencement of terrestrial vegetation* on the surface of our globe in which *large coniferous trees* did not exist. But our present evidence is insufficient to ascertain with accuracy the *proportions* they bore

to the relative numbers of *other* families of plants, *in each of the successive geological epochs, which are connected with our own* by a new and beautiful series of links, derived *from one of the most important tribes of the vegetable kingdom.*" "These discoveries are *highly important*, as they afford examples among the earliest remains of vegetable life of IDENTITY IN MINUTE DETAILS OF INTERNAL ORGANIZATION *between the most ancient trees* of the *primeval* forests of our globe and some of the *largest living* Coniferæ." —*Bridgewater Treatise on Geology.*

Our Author has also, as we have seen, analogous facts in relation to animals, to which the following may be added: "In the museum at Milan I have seen a large part of the skeleton of a Rhinoceros *from the Sub-Alpine formation*, having oyster-shells attached to many of its bones in such a manner as to show that the skeleton must have remained undisturbed for a considerable time at the bottom of the sea."—*Ibid.*

Citations of the foregoing nature might be greatly multiplied. But, from what we have now seen of the admitted facts in Geology, it appears abundantly that its speculations as to the antiquity of the earth and its inhabitants, its system of progressive developments, &c., have in reality no foundation whatever. The basis upon which the whole fabric reposes—the exuviæ of extinct animals and plants—is shown by Geology itself to have no such existence as is required by the various details of its theoretical conclusions. But independently of the foregoing admissions, if, as I have demonstrated beyond any contradiction, the entire system of spontaneity of living beings, starting with the elements of matter, and including Darwinism, Spencerism, Büchnerism, and all analogous doctrines, is totally false, we should infer with certainty, *a priori*, that the whole fabric of Theoretical Geology, for which the developmental hypothesis was invented, is equally false. (See Chapter VII.)

Darwinism, and the other so-called "New Sciences" which discard Revelation, would not have advanced beyond their old foundations had not the Sacred Narratives of Creation and of the Flood been so perverted to meet the speculations in Geology that the former is regarded, at best, as a vague tradition, and the latter simply as a myth. But these Narratives must be met by those of their opponents who have any regard for conflicting

evidence; particularly the Narrative of Creation. That of the general Deluge is not much of an obstacle to the "New Sciences," and is dismissed as unworthy of consideration. But the former is a competing system of Cosmogony; and if it be the offspring of a mind upon which Science had not yet dawned, it is remarkable that it is in no respect contradictory, as is generally assumed to be, of established principles in the various Sciences, nor of any proper interpretation of geological facts; but, on the contrary, it embraces, as I endeavored to show in my former work, an outline of a *perfect system* of the most comprehensive philosophy. That Revelation of Creation, which was vouchsafed to man in the midst of Egyptian darkness, will therefore be again summoned to our aid in the next following Chapter. (See, also, Appendices.)

CHAPTER XIV.

ANALYSIS OF THE NARRATIVE OF CREATION. — ITS INTERNAL PROOF ESTABLISHES THE EXISTENCE OF THE SOUL, AND ITS OWN LITERAL MEANING THROUGHOUT.

In the present chapter it is my purpose to show demonstratively that the Narrative of Creation abounds with internal proof of its Divine communication to man; and this being established, we shall have obtained a full confirmation of my demonstration of the substantive existence of a Soul, and equally, also, of a Principle of Life. As this is a primary object of the analysis, we will first have before us the premises in relation to the Soul. Thus we read that—

"God said, Let Us make man in OUR IMAGE, after OUR LIKENESS. And God created man in HIS OWN IMAGE. In the IMAGE OF GOD created He him."

An affirmation four times repeated, and with the emphasis of an immediate succession, apparently to protect the statement against the assaults of the coming adversary.

Again, in the second chapter, or that of details, we are told that—"The Image of God" means a "Soul," and, moreover, that the forces of inorganic nature were not adequate for organic beings, and that they must not be confounded with the Principle of Life. Here is the sublime and expressive announcement (although some quarrel with the language), in twenty-seven words —seventeen in Hebrew:

"And the Lord God formed man *of the dust of the ground* and breathed into his nostrils the BREATH OF LIFE; and man became a LIVING SOUL."

Animals were equally endowed with the Principle or Breath of Life; but man is distinguished from them as having besides a *living Soul.* Here, then, both a Soul and a Principle of Life are taught by an Authority from which there is no appeal—so only the Authority be acknowledged. Here was no agency of the

chemical or physical forces. The whole plan was perfectly distinct from that of inorganic matter. The fabric of the new being had no analogies with the former, and his phenomena were all distinct and without a semblance to any thing that existed before the beginning of vegetable life. This in itself supplies an irresistible proof that new forces (or the same as designed for animals and plants) were created for the government of his organization, and to constitute the essence of his life. But, as if to convey a full and distinct impression that man is not the creature of the physical forces, nor amenable to their operation, the inspired writer, after informing us that all the varieties of organization were direct and specific acts of God, and thus contradistinguishing organic from inorganic matter, proceeds to state the manner in which Life was imparted to the miraculous fabric of man simultaneously with a Soul. Lucid brevity is a sublime characteristic of the Account of Creation; and hence the compact phraseology—"He breathed into his nostrils the breath of *Life*, and man became a living *Soul*." It was enough, also, that the details of man's creation should be stated, to enable the greatest skeptic to understand that the same Life which appertains to animals and plants was also a distinct creation. Man was taken as an example of information on this subject, being the most perfect of created organisms. The analogies among all their vital phenomena, and the equal disappearance of those phenomena after death, are so perfectly plain, that none can doubt the identity of the forces upon which they depend (especially among animals), or that they came into existence by analogous acts of their Creator. But we have, however, in relation to animals, the same statement of their formation out of the earth as in the case of man; the Author of the revelation seeming little disposed to leave any ground to the unbeliever. It is true, there is nothing said, as in the case of man, as to the successive steps observed in their creation. But it is just so in regard to woman, of whose creation there is nothing said in the way of repetition; the general plan having been indicated in the account of man. It is said, however, that she was made out of a rib of man, as this was a distinct circumstance. Man is also connected with animals by Instinct, as well as by other analogies not less remarkable; and the Principle of Unity of Design is carried out, as we shall

see, in a wonderful manner in respect to the vegetable kingdom.

Again, had the forces of inorganic matter been adequate to carry on the operations of organized beings, man would have been a living body before the act of "breathing into his nostrils," or, in language divested of a highly expressive metaphor, before the act of creating his living essence. The physical forces, already existing, would not have been created anew for the special use of organized matter. This reasoning is only in conformity with the admitted fact that the Almighty does nothing superfluously, nothing that is useless. The Vital force of man, then, came into existence with his Soul, as did that of animals along with Instinct. And, pursuing the descending analogy, we come to simple organic life as manifested in the vegetable world, where it is modified in conformity with the peculiar economy of plants. The analogy, however, is very remarkable, as we have seen, between the functions of plants and animals.

If, then, as we shall have shown from Revelation, after substantiating its literal meaning throughout, as well as by a variety of demonstrations (see Chapter VII.), that a Principle of Life was a direct act of Creative Power, how much more obvious is it that the statement in relation to Life is a corroborating proof that a Soul, which is far more distinguished by its peculiar phenomena, and whose existence and self-acting nature is more demonstrable, was the simultaneous work of the same Almighty Power.

And how, in the benighted times of Moses, could the greatest of all improbabilities have been surmised, that—"The Lord God formed man of the dust of the ground"—a fact, indeed, which has been known only since organic chemistry applied its analysis in very recent times.

What I have now appropriated from the Narrative of Creation is conceded in a qualified manner by one of the latest advocates of the doctrine of the correlation or equivalence of the physical and vital forces, Dr. H. Bence Jones, in his Croonian Lectures for 1868, on *Matter and Force*—

"If the Book of Genesis," says Dr. Jones, "be a revelation of physical science by the Almighty to man, then the existence of *vital force* separate from the full-formed body is true, and must

be believed; but if this Book, so far as regards science, represents *only the existing* state of knowledge at the time it was written, as is shown by the facts mentioned in it *contradicting* the revelation which the Almighty has made in His works, then, whatever may be the interest we feel in the *earliest record* of scientific knowledge, still, it can not be allowed to possess any scientific authority in determining what is the true relation of matter and vital force."

Nothing here, however, about the Soul; but if the "Vital Force" be taught by the Narrative, then certainly the Soul likewise. I demur, also, to the qualification—"If the Book of Genesis be a revelation of physical science," &c.; for, although that may not have been in the least its object, it may, nevertheless, as I shall endeavor to show, present a perfectly scientific account of Creation; while, also, it will have been variously seen, there are no "facts mentioned in it *contradicting* the revelation which the Almighty has made in His works." If such, indeed, were the case, then the Narrative of Creation could not have been prompted by the Almighty, but was simply the deceptive work of an uninformed man. Dr. Jones, however, proceeds to invalidate the Narrative in the following manner:

"The contradictions between the Book of Genesis (that is, the Narrative of Creation) and the revelation given in God's works, are seen in the statement—1st, that day and night existed before the sun was made; 2d, that darkness was as much an entity as light; 3d, that the moon had a light of its own like the sun; 4th, that the firmament divided the waters from the waters—in other words, that there was water compared to the sea above the heavens; and 5th, in the particulars regarding the order and time of creation of inorganic and organic things."

If the foregoing objections can be shown to be without foundation, then must the Narrative of Creation come out triumphantly against "Modern Science," and in full testimony of its own emanation from Omniscience. But the reader will not lose sight of the fact that I have already, in the foregoing chapters, very extensively and demonstratively placed Revelation in the right, and "Science" badly in the wrong. I now come to a verbal examination of the Narrative, and to a critical consideration of the objections alleged.

In the first place, then, "Science" has done great injustice to the Narrative in affirming that it violates gravitation, and its own consistency as to light, and the succession of night and day from the outset, in stating that the sun was not created till the fourth day; since its creation is embraced in the statement that the whole universe was brought into existence on the evening or beginning of the first day, though all in an immature condition. And how could even a writer of such an account, acting upon his own judgment alone, have made the blunder of introducing a succession of light and darkness as forming the periods of the first three days, and in harmony with the remaining three, and then immediately contradict himself by affirming that there was no sun until the fourth day! But, as we shall see, a magnificent Unity of Design has here been interpreted to the discredit of the Narrative, and to Science as well.

As to darkness, it is no more declared to be an "entity" than it is by the scientific of the nineteenth century. Throughout the Narrative, the only meaning intended to be implied is the absence of light. Nor is it said, or intimated, that the moon shines by its own independent light, but simply what every impartial observer must concede to be the fact.

The wits of a multitude of able men have been exercised over the plain statements embraced in the first and second verses of the Narrative, until they have made them appear very obscure to their readers; and for this, as we have shown extensively, Theoretical Geology is responsible. Let us see farther:

"*In the beginning God created the heaven and the earth.*" Can a better account of the general fact of Creation be imagined, or a more sublime introduction to the Holy Scriptures? There the Narrative might have ended; for it comprehends every thing in heaven and on the earth. But for man's reasonable gratification, and doubtless, also, to protect him against fallacious speculations, the Creator informs him of the condition of the Universe when so created, and of all the important facts relative to the globe he inhabits, and in wonderful consistency—nothing more. The Creator first informs us that when the earth was launched into being—"*it was without form, and void;*" that it was in a chaotic state, and remained without an inhabitant till the third day. "*Darkness was upon the face of the deep; and the Spirit of God*

moved upon the face of the waters." Here is a direct affirmation that the earth was in a state of *aqueous solution;* and on the third day this is reaffirmed—"*And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear. And God called the dry land earth; and the gathering together of the waters called he seas.*" This original condition of the earth in a state of *aqueous solution* is proven, as I have demonstrated, by all the primary rocks; which attest, also, the direct instrumentality of the Creator, in connection with the properties and laws He had impressed upon matter in organizing the earth, and which is clearly affirmed by the statement that—"The Spirit of God moved upon the face of the waters," as well as by the more direct statements. (See Appendix I.) This will rescue the Narrative from the conflicting "nebular hypothesis," and prove another evidence of its Divine communication, and that it is incomparably more scientific than the cosmogonies of its competitors.

Had the general announcement in the first verse been wanting, and the writer had begun with the earth alone, it would have implied a violation of the universal law of gravitation, or have thrown, at least, an obscurity upon the work of the fourth day, which could have been cleared up only by that philosophy of Design which it is my purpose to indicate. And yet it would have been a most probable mistake for an uninspired writer at that age of ignorance in astronomy, and especially on account of his limitation of all his details to the earth and its inhabitants, to have assumed that the earth alone was created "in the beginning;" nor is the indispensable importance of the first verse even now appreciated, either in its philosophical bearings, or as indicating the "evening" of the first day. The question as to the supposed "long indefinite period after the beginning," and before the creation of light, as well as the prolongation of the Six Days, has been considered in the thirteenth chapter in its relations to Theoretical Geology, as well as its abstract merits; but it must necessarily engage our attention in our more direct interpretation of the Narrative.

I may now say that the word "created" means simply to bring into being, without any reference to the condition in which the objects were produced, and it applies as well to the several

successive steps in the completion of the earth as to the primary creative act, and therefore equally so to all other orbs. The analogy which is supplied by the whole series of creative acts in regard to the earth, even of man, enforces the conclusion that the other planets, and the sun, and moon, and stars, were, like the earth, produced in a chaotic state; as we shall also find to have been indispensable to Unity of Design in other respects.

In the same general and sublime language we are told that the Creator entered, *in Propria Persona*, upon the work of reducing chaos into those systems of Design which make up the philosophy of all the sciences. "*The Spirit of God moved upon the face of the waters.*" If that expression mean any thing, it is that Creative Energy was still in operation after the earth was created *without form*, and void of living beings; while, also, if it be allowed that a Creator subsequently supplied the "*void*," then, by the soundest logic, He was not less concerned in reducing the earth itself from its chaotic state, and which we shall find to be fully attested by the constitution of the primary rocks; and thus also multiply the internal proof of the Divine origin and literal meaning of the Narrative. But the inspired writer informs us very circumstantially of its intended meaning throughout the Narrative, and in a manner which demonstrates its inspiration.

And "*God said, Let there be light, and there was light.*" Could it have been better or more intelligibly stated? It was, as it should have been, the first thing done in the progressive systematic work after bringing the earth into being. Its action, especially that of heat, is exerted as well upon inorganic matter as upon organic beings; and there was the unfinished sun, which may well be supposed to have been endowed in its chaotic state with a principal means of fulfilling its great purposes. But there would have been no perfect diffusion of light until the creation of the "firmament," or refracting atmosphere, on the second day, and the completion of the sun on the fourth day. It makes no difference in regard to the indispensable necessity of the sun to the existence of what the act of *creating light* implies, whatever theory of light be adopted—whether the undulatory, or shining by its own light, or "a mere mode of motion." And thus, although there could have been no refraction and dispersion of light on the first day by an atmosphere, the revolution of the

earth upon its axis removes those stumbling-blocks, that "God divided the light from the darkness," calling one of them "*day*" and the other "*night*," and which was farther defined, both as to nature and duration, by the pronunciation that "*The evening and the morning were the first day*," and so on till the great luminary was completed on the fourth day. And how critically exact is the prefixing of the "evening," and maintaining this harmonious relation to "morning" throughout the Six Days.

Here is Philosophy in the midst of primeval darkness! *All but the sun on the wrong day*, the complainant answers; though some, like the distinguished Professor JAMESON, strangely suppose, as he expresses it, that "the earth was during the epoch of the fourth day finally brought into its present orbit." What a contrast with the symmetry of the Narrative! And although these Philosophers insist upon the greatest latitude in regard to the interpretation of words, when it suits the purposes of speculation, yet in other instances, and for the same objects, as with the word "*made*," they maintain its literal meaning, although in violation not only of the laws of gravitation, and of obvious Design, but of the whole context of the Sacred Narrative. Thus, again, Prof. JAMESON, in *Edinburgh Journal*, vol. xxv.:

"A careful examination of the first chapter of Genesis itself leads unavoidably to the conclusion that our natural day *of one revolution of the earth can not be meant by it*, for we find that no fewer than *three* of the six days had passed before the measure of our present day was established. It was only on the *fourth day*, or epoch of Creation, that 'God *made* two great lights,'" &c.

Another interpretation supposes the equal absurdity that light was created on the first day independently of the sun, and was *gathered up* and put into that orb on the fourth day. Thus the Rev. Mr. MACDONALD, in his "*Creation and Fall*," 1856—

"The fourth day is occupied with *regulating* the light created on the first day—*collecting* it into the heavenly orbs, which are henceforth to illumine the earth."

And all this belongs to "Modern Science." But it will be seen that it is the deficient in science, and the dissatisfied, and not the Author of Nature, who have made the blunder. Moses had no knowledge of the nature of light excepting that it is emitted by the sun; and the absurdity of the explanation just

quoted from MacDonald assures us that the writer of the Narrative intended to be understood that the sun and the whole universe of orbs were called into being simultaneously. And all this of a general nature being sufficiently implied, the absence of farther detail is an intrinsic proof of the Divine source of the information.

There was a dispute in the early Jewish Schools as to whether the heavens were created before the earth, growing out of the circumstance that the former is mentioned first. In the second century, however, it was generally considered settled, in conformity with the laws of gravitation, by Biblical authority. This was due to a right translation of Isaiah xlviii. 13, by Simeon ben Jachai. Thus—"Mine hand also laid the foundation of the earth, and the palm of my right hand hath spanned the heavens; when I called unto them *they arose together*."—*Manasseh's Conciliator.*

Since, however, the work of Creation was progressive and exactly systematic throughout the Six Days, had it been said particularly that the sun was "*made*" on the first day, it would have implied that it was *finished* on that day, and thus have fatally violated Unity of Design, since that orb was intended to subserve the uses of the planets and the vegetable and animal tribes. The planets, therefore, were completed first; nor should the sun have been brought into maturity until required by vegetable life. And so, also, by analogy, of the stars. And as the moon was, like the sun, intended for the uses of the earth, it would equally have violated Unity of Design to have placed its completion on any other than the fourth day, and when, also, the sun was prepared to bestow upon it its full measure of light. And here, it should be observed, is a very critical proof, like that of the sun, of the Revelation of the Narrative, and in its most literal sense; for it can not be doubted that an uninspired writer would have placed the completion of the earth's satellite on the day of the earth itself.

The order of Design would have also failed in a fundamental point had the completion of the sun been any longer delayed; since the introduction of plants rendered its perfection necessary at that exact juncture of time. And so, also, of the moon in its subordinate relations to the earth. And thus we see displayed the exquisite nature of that SCIENCE (so constantly denied to

God's direct Revelation) which established, "in the beginning," those laws of gravitation which were to govern the heavenly orbs, and provided light for all the wants of the earth up to the fourth day, and in delaying the completion of an act which was to answer only a subordinate part to the worlds of our system when they should be finished and ready for their living tenants. Moreover, it will be seen, when we come to our demonstration in Appendix I. that the earth was created in a state of aqueous solution, that all which is affirmed of its subsequent organization is impressed upon its whole condition.

Our supposed violations of Design would have fatally wounded the credibility of the Narrative as soon as philosophy should have come to its analysis. Or, had an uninspired writer made the blunder of implying that the first verse was only a general affirmation without any special reference to the subsequent details, as assumed by Theoretical Geology, and of delaying the creation of the sun until the fourth day, and have thus violated the exigencies of gravitation, as well as of "night and day," and of "darkness" and "light," and of "evening" and "morning," he would not have added the flagrant improbability to his story of creating light on the first day, since it would have appeared to him not only totally unnecessary, but even absurd, till the sun was brought into being. Or, again, in having introduced light on the first day, he would unquestionably have provided the sun along with it in a state of perfection. The foregoing statement, I say, could not have proceeded from any other source but Inspiration, in view particularly of the fact that nothing is said specifically of the sun till the fourth day; since it will not be doubted that an uninspired writer of that age would have followed the dictates of his senses, and have either introduced the sun along with light, or have delayed them both till the fourth day. And yet it is equally certain that he would not have made the apparent blunder of instituting a regular succession of "*light*" and "*darkness*" for three consecutive days, designating one as "*day*" and "*morning*," and the other as "*night*" and "*evening*," and have *delayed* the appearance of the sun until the *fourth* day, and then have rendered his statement still farther improbable by affirming that the sun and moon were created "*to divide the day from the night*," and for signs and for seasons, and for *days* and

years." But the creation of *light* at the particular juncture when it was commanded to appear was indispensable to the philosophy of Design, on account of the common relations of light to the Universe, as well as for other specific reasons which will appear in the sequel. Nor can any philosophical mind fail of perceiving an evidence of Infinite Wisdom in having associated this comprehensive act, this creation of an all-pervading principle, with the universal display of Omnipotence which appears in the first verse, and thus harmoniously, Divinely concluding the work of the first day, as a perfect systematic whole. The statements, therefore, thus far confirm themselves upon philosophical grounds, and through their contrast with improbabilities.

But more remains to be said of the sun to complete the climax of Divine Philosophy. That the subsidiary orb should not have been finished at the time of its creation, nor until the fourth day, not only follows from the foregoing premises, but was absolutely required by the order of Design as disclosed in the analogy presented by the earth. As the creation of the latter was progressive, and the former only subordinate and according to the progress of the earth, so, also, should we have inferred, from the analogy supplied by the earth as well as by the final causes of the sun, that this orb was alike a progressive work, had Revelation been silent upon the subject; and had it been otherwise stated or implied, Theological Geology might have triumphed even more than now over the blunder. But as the Record states the fact in the first verse, and confirms it on the fourth day, it is an indisputable internal proof of its Divine authenticity. And thus we might go on multiplying proof of the same nature upon this particular invalidation of the Narrative; as, for example, it is another proof to the same effect that nothing is said as to whether any thing was done to the sun on the second and third days (and the order of Design assures us there was not), or what was the condition of the sun when first brought into being, as this is wholly uninteresting to man, and as the sun is merely subordinate to the planetary system. If, also, the sun existed in an unfinished state on the first day, and was completed on the fourth, according to our demonstration, there was just as much truth and propriety in the language employed on the latter day as there was in describing the organization of the earth on the third

day. Nay, more; for while the circumstantial account of the creative progress of the earth is in exact correspondence with man's interest in the globe he inhabits, the account of the sun and moon, and of their uses, is, upon the same principle, precisely all that should have been communicated; and the laconic "*stars also*" is inexpressibly significant of the same Divinely graduated measure of information, according to man's relations to the several orbs respectively. And yet the solar system probably bears no greater relation to the systems of stars than a grain of sand to the earth. Observe, now, the contrast in details as they relate to the third and fourth days, and how abundantly full is the information of the fourth day's work:

"And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years; and let them be for lights in the firmament of the heaven to give light upon the earth: and it was so. And God made two great lights; the greater light to rule the day, and the lesser light to rule the night. *He made the stars also.*"

But while a philosophical silence is observed in regard to the details of creation that relate to the sun, moon, and stars, a stupendous philosophy is projected, with all the necessary outlines, for the exercise of reason in these discoveries which, when most latent, supply an impressive demonstration of the attributes of the Being who has thus hidden himself behind his own works.

Here, also, we find this writer, when the infancy of Science had scarcely begun, inculcating the most profound philosophy as to the immense superiority of the earth over the sun, and that the latter is merely subordinate to the uses of the earth; when, on the contrary, an uninspired writer would not only have made the glorious luminary the special work of his first day, but would have given to it that transcendent importance over the objects of the earth which is even now very generally ascribed to it.

Again: the analogy supplied by the earth leads to the necessary conclusion that the organization of the primary planets was carried on *pari passu* with that of the earth; while the same philosophy which assigns the completion of the earth's moon to the fourth day, refers the moons of all the primaries to that day.

And here, also, the same consistency obtains that we have seen of the communications relative to the earth, sun, and moon, according to man's immediate interest in one or the other; since, as all the planets and their satellites, excepting the earth and moon, have no greater relation to man than the stars, and are lost in the immensity of the latter, nothing whatever is said about them. And yet Revelation, through the analogies supplied by the earth and its moon, enables Reason to deduce the creative history of all the other planets and satellites. The several primaries and their moons form, therefore, two distinct systems, as they stand in the work of Creation; and since the earth's moon and other satellites sustain, like the sun, a subordinate relation to their primaries, they should have belonged to the same creative system as the sun and stars, and therefore have employed the Creator at the same time in a work so analogous in all its subsidiary parts. This, too, is evident from the unity and harmony of Design which is manifested in the remarkable individuality, and according to their *special final causes*, of all other distinct parts of the symmetrical whole. The same consistency of Design should be carried, also, to all the orbs from the analogies supplied by the creation of plants, and man, and animals, in a state of *maturity*, and according to their philosophical relations in the system of Design, and the different steps which were observed in the process of organic creation, and thus supply another proof of the literal meaning of the Narrative. Finally, I may present the language of the Narrative as apparently corroborating its own statements and what philosophy enforces, for—"*Thus* the heavens and the earth were *finished*, and all the hosts of them."

We have now seen that there "are many very remarkable points in the statement concerning the fourth day, and in its relations to the rest, upon either of which the soundest uninspired philosopher would have made the mistake, at least, of anticipating the order of Design. This, indeed, has been long and strongly evinced by the objection alleged against the Record, of having misplaced the sun and moon. But, to an uninspired writer, at the dawn of knowledge, there is scarcely any part of the account of Creation which would not have appeared far more improbable than to the enlightened of our own times; and who

will doubt that the most sagacious astronomer, with all the existing knowledge in geology and physiology impressed upon his mind, if employed in writing his own views of what *should have been* the narrative of Creation, would produce a scheme in which it would be difficult to perceive an outline of the Divine account?

But it has not been always exactly so. Indeed, it is remarkable with what accuracy this subject was considered by learned Jews in the *twelfth* century, as shown by the following quotation from an Author of the *seventeenth* century, and of whose work I had no knowledge when my interpretation of the Narrative of Creation appeared originally in my Treatise on Theoretical Geology (1856), and as presented in the present work without modification. The Author about to be quoted is endeavoring to reconcile the statement in the 4th verse—"*And it was evening and it was morning*, One Day," with the statements in the 14th and 19th verses—"*And God said, Let there be lights*," &c., "*And it was evening and it was morning, the Fourth Day.*" Among other early expounders, who had nothing in view but a faithful account of the Narrative, he quotes several as having rendered the following interpretation:

"MAIMONIDES (born 1131), in his 'Guide,' RASHI (1030), and ABEN EZRA (1119) in their '*Commentaries*,' held that the light of the first day was that of the sun itself, which, revolving in its sphere from west to east and from east to west, made a day of 24 hours. The Scripture saying that it was *created on the Fourth Day* is incident to its *thus demonstrating its effects upon plants*, which appeared on the Third Day; rain, which proceeds from the exhalations and vapors raised from the earth by the action of the sun's heat thereon, being necessary to their vegetation. Therefore, it is clear *that there was no new creation on the Fourth Day;* but the heat implies that on that day the sun developed the effects of his heat on plants.

"DION, *De Diei Nom.*, says the first light was the sun itself; but on the First Day was not complete, having the illuminating property in common, but subsequently a fixed and special virtue for particular purposes given to it.

"Isaiah, also (chap. xxx., verse 26), treating on a future age, says—'*The light of the sun shall be seven times the light of the Seven*

Days'—that is, of the Days of Creation, indicating that all the Seven Days had the same light."—MANASSEH'S *Conciliator*.

Having now disposed of the important objection to the Narrative that relates to the sun and moon, I return to the beginning to look at the *details* relative to the globe about which alone mankind have any special interest; and here, in consideration of that interest, Revelation has been as ample as it is philosophically exclusive in respect to other globes; and this, therefore, I mark in behalf of the inspiration and literal meaning of the Narrative. I proceed, then, to inquire as to what, in the Philosophy of Design, should have been the *next* act of Creative Energy after the introduction of light. Certainly, the production of the firmament or atmosphere. That was indispensable to unity and harmony of Design in a very comprehensive sense. And here I will make the important remark, in farther exemplification of Unity of Design, that as fast as Creation advanced, the materials produced, and the forces or properties and laws impressed upon them, were rendered subservient, in connection with Creative Energy, in the farther acts of Creation so far as they were applicable. This will be shown to be the case with the properties impressed upon the component materials of the earth when Creative Energy brought the constituents from their state of solution into a solid condition; and so far the process was rendered conformable to such as were to obtain independently of Creative Power. (See Appendix I.) The same remarks are applicable also to the Flood; though in regard to this catastrophe comparatively little of Miraculous Power was interposed. (See Appendices II. and III.)

As to the "*Firmament*" or Atmosphere, its creation was next in order after the creation of *light*—first, to *stamp down* or *beat down* (according to the exact meaning of the original word) the vapors which, by a law relating to their elasticity, enshrouded the earth; secondly, to refract the light more completely; and thirdly, to be ready for vegetation, besides less important immediate uses. It need not be said in what sublime harmony is all this; though to appreciate it in all its vast relations requires some knowledge of the laws of evaporation, of atmospheric pressure, and of optics, in their connection with the subject. In great correspondence, too, with the import of the word *firmament* is the word "*divided*," which, in the Hebrew, מבדיל, means, *to separate*.

And as there was necessarily a voluminous mass of vapor surrounding the globe prior to the creation of atmospheric air, this shows how critically exact is that other expression of "*waters above the firmament.*" All this, too, is a matter which has always been neglected or misapprehended, as we have seen in a quotation from Dr. Jones's Croonian Lectures (page 459). Least of all would the writer have known any thing of their philosophy, and therefore would have been entirely silent not only as to the waters above the firmament, but the firmament or atmosphere itself, had not the facts been divinely communicated. Indeed, Halley's theory that the evaporation of water depends upon a chemical union of vapor with the air, prevailed until Dalton showed that vapor is not only formed where there is no atmospheric air, but instantly formed on removing the pressure of the latter, and as instantly "stamped down" on restoring the pressure. That the writer of the Narrative, therefore, should have stated the fact that there were waters above the earth is one of the numerous internal proofs of its inspiration which establish its exact meaning in conformity with the plain import of the statements, and presents, as in all else we shall have seen, an impressive contrast with the efforts which have been made to crush this stupendous philosophy. Nor should we neglect, as a farther internal proof, the manner in which the atmosphere is made a special act of creation and revelation; for nothing can be more manifest than that such an invisible, intangible part of nature, and about which, indeed, the writer could have had very little knowledge, would have had no place in an uninspired narrative, while its omission would have left an invalidating hiatus.

The creation of the atmosphere, therefore, stands alone in its vast relations to the earth and its inhabitants, and should not only have preceded the earth's organization, but, by the same unity and harmony of Design that we have seen of the work of the first day, it should have occupied another entire day; since, in constituting a grand symmetrical whole in itself, the writer would have made a palpable confusion had he blended its creation with the work of the third day, which embraces totally distinct, but harmonious subjects. God called it both "firmament" and "heaven;" and as there is nothing else unaccounted for, and from its effect in "dividing the waters," it must necessarily have

been the earth's atmosphere. And this is also farther substantiated by the clear definition which is rendered by the expression—"and fowl that may fly in the open *firmament* of heaven."

As a matter of course, the organization of the earth follows next in the order of Design; but as this will form an extended subject of analysis in Appendix I., I dismiss it for the present and proceed to simply indicate the philosophy of Design in the creation of the vegetable kingdom as soon as the earth was in a condition to receive it, and when, also, light and atmospheric air were ready to take it in charge. Moreover, it was indispensable to unity and harmony of Design that the vegetable kingdom should have been produced on the third day, since there would have been a violation of Design in blending it with the totally distinct and systematic whole of the fourth day, and since, also, the vegetable tribes were philosophically and virtually indispensable to the existence of the animal kingdom.

It is quite unnecessary to carry our analysis into the fifth and sixth days of Creation, as enough has been already said of their relations to the antecedent days, and as they readily follow also the rule of interpretation which I have endeavored to establish. All the acts are in exact philosophical order in their prospective relations to each other. But there is something here in respect to harmony and unity of Design which is peculiarly impressive. I refer to the creation of aquatic animals and of the feathered race on the fifth Day, and land animals and man on the sixth Day. The former, in a great system of Creative Design, should have been produced simultaneously, and distinctly from all other work, on account of the peculiarities of their habits, and the analogy which subsists between the water and the atmosphere in respect to their fluidity, and their distinction in that and other obvious conditions from the solid earth; while, for a corresponding reason, land animals and man should have been associated in another special part of Design. No small proportion of the feathered tribes are also connected with water in their natural habits. Another minute circumstance may be seen in the critical manner in which the anterior creation of animals is placed in its proper relation to man's. The Design throughout this remarkable detail of the events of the fifth and sixth days is palpable, and evidently could not have been projected by an unin-

spired writer. Neither could the statement of so improbable a circumstance that man was made out of the dust of the ground, and by analogy animals and plants also, have been of human invention. Until the recent days of chemical analysis, it would have been naturally supposed that the component materials of living beings were as perfectly unique as light is distinct from the earth, had Scripture been silent upon the subject. Again, what but a direct revelation could have enabled the penman to assign the creation of man near to his own era; since he could not have deduced it from any uninspired history of the human race, nor from other memorials. Had the Mosaic Genealogy carried back the creation of man as far only as fifteen thousand years from our 19th century, it would have been contradicted not only by the earliest memorials, and the scanty population of the earth three thousand years ago, but by the rapid progress of the arts and sciences as soon as the foundation was laid. (See Chapter XII., on the Antiquity of Man.) And yet how great the probability, as we may learn from our own propensities, that an uninspired writer would have placed the creation of man in a remote past, instead of within less than three thousand years of his own time! And what a stupendous internal proof is supplied, in other respects, by that *Genealogy*, in enabling man to trace up his lineal descent to his first ancestor! Here is the great final cause of that Genealogy; nor would the advocates of Darwinism surrender it, whatever their pretensions. What a restless being man would have been without the ability to assure himself, or to relieve his skepticism, by a reference to the Record of the origin of his race, or even his relations in time to the globe which he inhabits! To know and remember the past is an innate disposition that distinguishes man from the brute; and since it has been implanted by the Creator, it can not be doubted that He would have provided some history of the most interesting of all temporal subjects, both in consideration of the innate desire and as supplying an unbroken succession of eras along which the mind travels backward in estimating the progress of civilization and knowledge. It would have been, therefore, an obvious defect in Revelation had this information been withheld. And who does not see that if mankind had been left without this information, Theoretical Geology would have suc-

cessfully placed at defiance not only all the facts that go to demonstrate the very recent creation of the human race, but, in its propensity for speculation, would have involved the whole race in the appalling vortex of spontaneity of being and a soulless existence! (Chapters VII., VIII., XII.) Give to Theoretical Geology its "long indefinite epochs," the peculiar charm which links us in close alliance with the Creator is broken. We should be separated by an abyss of time as incomprehensible as eternity, or liable, at least, to its assurance by the contingency, at any moment, of the discovery of a human bone in the low fossiliferous rocks or in the coal-formations. We should be utterly lost in the confusion of "creations and extinctions," or ready to surrender to the developmental hypotheses which begin with the elements of matter or a self-existent primordial form or cell. Then it might be pronounced with greater justification that—"organic nature is the mystery of mysteries." We turn to the Record, and there only do we find relief from the harassing doubts and anxieties which Theoretical Geology has engendered; excepting, indeed, the corresponding assurance which is derived from the monumental records of the last four thousand years. And since, also, the writer of Genesis has accurately announced, by common admission, the recent creation of man, it must be conceded that this remarkable statement renders it in the highest degree probable that he is equally correct in his genealogy of the antediluvian group. Nor can this be disturbed should it be established that sharp-eyed critics have detected unimportant errors in subsequent genealogies that may have crept in in the infancy of writing. And here I may notice the remarkable coincidences in the references which are made to "*the generations of the heavens and of the earth in the day that the Lord God created the earth and the heavens*" and "*the generations of Adam, in the day that God created man in the likeness of God*," and which contribute to each other a mutual support. The objects were analogous as it respects the chains of connection; and while "the generations of the heavens and of the earth" are presented according to the exact periods of time in which each part was brought into being, "the generations of Adam" are defined with a precision which enables mankind, through the medium of Noah and his family, to compute forever the period in eternity when time began.

The genealogy of Adam was also designed to indicate the time when the present order of nature began; otherwise Theoretical Geology would have enjoyed an unrestrained liberty with its myriads of ages. And what would have been the doom of the whole Christian Dispensation in its relation to sin, should the efforts to discard the Mosaic genealogy obtain the general consent of mankind? Whither would the thoughts of man conduct him in his speculations upon the dispensation of the Creator in permitting the corruption of human nature, and the "curse" which is stamped upon human affairs, without the circumstantial revelation upon which mankind may now rest with an assurance that it was, at least, their own optional condition? Where would be the consolation and the countervailing goodness of the Creator, which, in their connection with Christianity, are meted out in the early promise of a yet hopeful future?

The Mosaic Genealogy, therefore, is of Divine origin, and has, of necessity, a final cause which can never be defeated. That object, as I have said, is to enable man at all times to trace up his connection, in a comprehensible manner, to his created parents, and to thus connect himself, in duty, dependence, adoration, realization, with the Being to whom he owes his existence and enjoyments, while his sympathies with his race shall preserve, by the same means, an unbroken chain, his rational curiosity be always satisfied as he mounts along the line of his descent, till he comes to a limit where inquiry merges into contentment, where his Soul rests upon the outskirts of Creation, and beyond which he discerns nothing but an eternity from which he impulsively shrinks to dwell upon events within the grasp of his knowledge. Such, then, being the only final cause of the Mosaic genealogy of man, and being of God, nothing can defeat its full operation. It is, therefore, plain that before this backward path can cease to be travelled in an intelligible and comprehensive manner, there will be an end of time in relation to man; and instead of the "millions of ages" which Theoretical Geology prophesies as an equivalent to man for the "millions of ages allotted to animals before our times," or that "the *end* of the scheme," according to Sir Charles, "is too vast to be within the reach of our philosophical inquiries, or even our speculations," no rational man will pretend that, with all the advantages of a chain of historical me-

mentos, monuments of art, &c., he can grasp even a period of 100,000 years. As the mind glances at such a period of time, either past or to come, it is lost at once in the immensity of space. The Mosaic genealogy, therefore, has an interesting bearing not only upon the era of man's creation, but the geological prospects of the present order of nature; and we thus reach the conclusion, also, that reason teaches exactly what God reveals.

If, however, on the other hand, the objects of the genealogy be not of the intellectual and moral nature which I have assigned, what was the motive for its institution? Or is it objected that if such have been its objects, why was it not delivered to man till the era of Moses? I answer, for the plain reason that it was rendered superfluous by the longevity of man anterior to the Flood, which happened *Anno Mundi* 1655, when Noah, the ninth in descent from Adam, was 600 years old, and Moses was almost a contemporary with the inmates of the ark.

More remains to be said of the special details of Creation as supplying farther internal proof of the revelation of the Narrative and of its literal meaning. I have hitherto gone elaborately, especially in Chapter VII., into a demonstration of the absurdities of spontaneity of living beings, and of all the doctrines of the evolution of animals from a "primordial form" or "cell," &c. But more than that: I have also presented a very special demonstration of the absolute necessity of the creation of man and all mammiferous animals, and all birds whose young are unfledged, in a state of maturity both of body and mind, and that thence the principle must have been coextensive with the animal kingdom. Unity of Design, therefore, required a mature creation of the vegetable kingdom, as a part of a consistent whole. But besides the consistency of Design, that maturity of plants was indispensable to the animal kingdom; and as if a disbelief of the statement would spring up, two other special reasons are assigned—"*For the Lord God had not caused it to rain upon the earth, and there was not a man to till the ground.*"

This was on the day preceding the completion of the sun; and we are thus supplied by Unity of Design with an exquisite internal proof of a threefold nature: 1st, of the sun's completion on the fourth Day; 2d, of the creation of the vegetable kingdom in a state of maturity; 3d, that there was no rain till the

fourth Day—since the completion of the sun was not only necessary to vegetation, but to that evaporation of water which should result in rain.

And again, in great consistency of language as well as of purpose—"The Lord God *planted a garden* eastward in Eden." And yet there should have been, in the economy of Design, seeds in the earth to be at once ready for vegetation, as they are only of annual production by plants. Had the creation of plants "before they were in the earth" been alone announced, and which was specifically and alone intended for the *immediate* wants of the animal kingdom, there would have been a manifest defect in Design in neglecting an important provision (the seeds) for the peculiar economy of vegetation. But more than that; had the writer confined his statement to the production of seeds, it would have most deeply wounded the consistency of the Narrative; since no provision would have been made for the tribes of animals that subsist upon plants. To this should be added, also, the consideration that the mature creation of plants is unquestionably one of the last things that would have occurred in those early days to the mind of any one not informed of the fact. Indeed, there are many writers who deny that Revelation inculcates such an opinion, and regard it, as they do the mature creation of animals, as an absurdity. "What!" says Theoretical Geology, "create the sap, and bark, and the concentric circles by which we determine the growth of plants!" Why not as well as blood and the various animal organs? Why not as well as the sap, the germ, and the several other component parts of seeds?

Nor may Theoretical Geology explain away the direct affirmation that God created "every plant of the field before it was in the earth, and every herb of the field before it grew," by the natural phraseology in which the event is also expressed, and which has an equal reference to the created seeds—"Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit," &c., since the same language is employed in relation to animals—"Let the earth bring forth the living creature after his kind, and cattle after their kind," &c.; while it is declared in the next following verse that—"God *made* the beast after his kind," &c. And, as I have demonstrated the necessity of the direct creation of animals in a state of maturity (Chapter

VII.), it follows that what is said of the connection of the earth with their production is simply a figurative allusion to their intimate relations to the globe; and therefore more particularly so as it respects the creation of plants.

The advantage which Theoretical Geology has taken of the foregoing figurative language in regard to the creation of animals and plants, while it neglects the explanatory affirmations that they were direct acts of Creative Power, and in a state of maturity, supposes the greatest absurdities that have ever disfigured the annals of Science — seventeen elements detaching themselves from their inorganic combinations with forty others to form all the beasts of the earth, while the birds and all aquatic animals are devoutly supposed by "Geological Science" to have been evolved by "the parturitive powers of water," which is composed of only two elements! The figurative expressions in relation to land animals and plants refer simply to their special place of abode, while that in regard to aquatic animals is alike significant; and as birds fly in the air, and many swim the waters, their habits are thus denoted when speaking of their creation.

But, as the vegetable world is indispensable to the animal, had it been distinctly said, as it certainly would have been by an uninspired writer of the time of Moses, and as Theoretical Geology maintains, that the first plants grew up from their embryo state, or had the affirmation that plants "were created before they were in the earth, and every herb before it grew" been omitted, it can not be doubted that Geology would have hailed in the fact a flagrant violation of the exigencies of the animal tribes, and a fatal defect in unity and harmony of Design.

Besides what I have now said upon the subject before us, I have hitherto presented an argument founded upon the coincidences between the whole elementary, organic, and physical constitution of man, animals, and plants, and the equal evidences which they supply in their apparently endless and concurrent designs, that they were harmonious parts of one consistent plan (Chapter VII.); and therefore we are compelled, philosophically, to suppose that plants, like man and animals, were originally the direct production of Creative Power. Also, the intended purposes of the vegetable kingdom equally enforce the certainty that

the Creator (who, it is admitted, does nothing in vain) did not clothe the earth with vegetation till just antecedently to the creation of man and animals, for whose uses it was alone intended. What, therefore, Philosophy thus enforces is exactly concurrent with the Mosaic statements.

But here is something more—a coincidence of statements which would be proof enough for the determination of any other question—namely, that Adam found on the sixth Day the Garden of Eden all in bloom for his reception. You grant, perhaps, the animals, but halt at the plants. But surely there is a greater difficulty in supposing that the wits of the writer would have led him to fabricate the statement as to the maturity of plants, that it should be consistent not only with his statements as to the creation of man and animals in a state of maturity, but, more improbable than all, that he should have contrived the statement relative to plants so as to meet the exigencies of a natural day, the exigencies of animals as to food, and the statement that the garden was ready for Adam on the sixth Day. Geology, indeed, corroborates these precise statements of the Narrative. "The evidence of organic remains," says Dr. BUCKLAND, in his *Bridgewater Geology*, "shows the origin of plants and animals to have been *contemporaneous*. If any creation of vegetables preceded that of animals [as *speculative Geology assumes*], *no evidence* of such an event has yet been discovered by the researches of Geology." And I say, moreover, that the foregoing various coincidences, so replete, also, with the perfection of Design and unity of plan, and especially the wonderful coincidences that are involved in the statement relative to plants, establish conclusively the natural length of the Creative Days. Such a compact system of multifarious parts, and all concurring together in the most perfect harmony, and each indispensable to the rest, forms a mass of circumstantial proof far beyond any thing that has so often consigned the transgressor to the dungeon or the gibbet.

The statement in regard to the creation of plants in a state of maturity, and the simultaneous production of seeds in the earth, is probably the most remarkable of any on record in its comprehensive import. This is seen, 1st, in its necessity to unity of design as it respects the mature creation of man and animals; 2d, in the necessity of plants to the immediate wants of animals; 3d,

in the creation of seeds, that there should be no failure of a succession, particularly of annual plants; 4th, in the great probability that the production of seeds in the earth would have appeared to an uninspired writer to render the creation of plants a work of supererogation; 5th, in making the latter statement a matter of special detail after the general statement that embraces the seeds; 6th, in assigning reasons for creating plants in a mature condition; 7th, in the necessity of the statement as demanded by the natural length of the Mosaic Days; while its absence, and the statement as to the seeds, would have occasioned very natural doubts as to the means of supplying food to the herbivorous animals on the fifth and sixth days; 8th, in the manner in which the omission of so important an event would have impaired the authenticity of the entire Narrative.

After the production of the universe in a chaotic state on the evening of the first day, the foregoing order of Creation as it respects Light, the Atmosphere, the completion of the Earth, then of the Sun, the creation of Plants, next of Animals, and lastly of Man, and their intimate and dependent relations as constituent parts of a progressive system of Designs, form an irresistible internal proof of the Inspiration of the Narrative, of the absolute creation of all organic beings in a state of maturity, and of the natural length of the Creative Days. Moreover, besides this special proof of Design, there is nothing whatever in the organization of plant, animal, or man, that would denote the foregoing order of succession; nothing to show why man should not have been the first being; nothing whatever to comfort the development doctrines. And to ascribe all this combination of Designs to the laws of nature would be the same as referring it to a direct act of the Creator Himself.

If the critic should desire information as to whence came the necessary soil for the seeds and created plants so early as the third day, I would refer him to my work on "*Theoretical Geology*," where I have endeavored to show that it would be a very probable consequence of the organization of the earth out of its solution in water; and, moreover, that the earth contained the requisite solvent materials for such a solution. (See also Appendix I.) And why should it be any more objected that a provision for the sustenance of plants was thus indirectly made, particularly as

the continued existence of the animal kingdom depends upon them, than that the means of sustenance were provided in a direct manner for man and animals. Least of all, however, can Theoretical Geology, while resting with complacency upon its "remodellings of the earth," "progressive developments," &c., arraign our much-needed provision for the roots of plants and for seeds, although it be no more in the Book than any of the assumptions of Theoretical Geology. But here Geology comes to our aid with its own facts, for among them it finds the exuviæ of both plants and animals as low down as the transition rocks. Indeed, "*In all the stratified rocks above the primary*, more or less of the relics or traces of animals and plants occur," from which it necessarily follows that—"Dry land, *capable of sustaining vegetation*, must have existed soon after the deposition of the fossiliferous rocks commenced."—HITCHCOCK's *Geology*. But more than that; for we have seen that animals and plants of the highest organization are found in the lowest of the secondary rocks. From all which it appears that Theoretical Geology is as much in need of pulverulent earth for vegetation as ourselves. (See Appendix I.)

We have already had before us, in a general manner, the question as to the length of the Mosaic Days; and as this is important to the authenticity of the Narrative, I shall endeavor, as in my former work, to show still farther that the "Evening and Morning" of those days were of the duration of our own day. In accomplishing this, the literal interpretation of the Narrative throughout will be no longer doubtful; and we shall have thus obtained the Divine sanction of our demonstration of the substantive existence and self-acting nature of the soul.

The inspired writer evidently anticipated the infidelity of future ages upon this subject; for, very remarkably, in so brief a Narrative as that of Creation, he defines the length of the Creative Days in three different ways "evening and morning," "light and darkness," "day and night." And coming to the Fourth Commandment, we are again very forcibly reminded to beware of the speculations of Theoretical Geology. Why is the word "*evening*" associated with the other explicative, "*morning?*" Why was one called "*night*" and the other "*day?*" Will Theoretical Geology answer us that? They must be interpreted in some sort of consistency with the geological assump-

tion of long indefinite periods, especially the words *evening* and *night*, and in their explicative relations to *morning*, *light*, and *day;* and they must be interpreted, too, in perfect conformity with the true intent and meaning of the Fourth Commandment, which is predicated of the declaration in the Narrative, that—"*God blessed the seventh day, and sanctified it; because that in it He had rested* [desisted] *from all His work which God created and made.*" It must be shown, also, from analogies derived from the present races of animals and plants, that long periods of *darkness* as well as of *light* were most conducive to their growth, multiplication, and general well-being. That there was absolute *night*, positive *darkness*, and *daylight*, and in regular alternation as at the present time, is most emphatically and variously announced; particularly that—"God called the *light Day*, and the *darkness He called Night;*" and all these Divine names, with only one possible meaning in their aggregate relations, have been regularly perpetuated down to our own time. Moreover, He said "the *evening* and the *morning* were the first day;" or, more exactly—"*And there was evening, and there was morning*, ONE DAY—Hebrew, אחד יום, *yom ahad.* Thus, at the very outset of Creation, the inspired writer defines what is meant by *evening* and *morning;* and how could this have been done so clearly and effectually as by declaring that they constituted *one day?* And mark the farther exactness—the *evening* before the morning, because darkness preceded light. This being obtained, the analogy passes over to us in behalf of the obvious meaning of the other days.

Again I ask, do all these precise and expressive terms—*evening* and *morning*, *darkness* and *light*, *night* and *day*, in their immediate relations, *word and word*, *term and terms*, each separately and collectively defining the others, stand for "*long indefinite* periods of time," or "cycles of ages?" Was such the intended meaning of these several definitions? Let the child answer. And why has Theoretical Geology expended so much labor upon the word יום, *yom* or *day*, and utterly neglected the NIGHT? Why has it not brought them in apposition, and defied the common sense of mankind? And what will Hebrew roots say to all this—especially "*yom?*" But the foregoing were not the only means taken by the Creator to enable Himself to be understood; for He also declared that He "*divided the light from the darkness;*"

and He still farther defined the meaning of the word *day*, as used to denote the duration of the Six Days, when He completed the organization of the sun by placing the word *day* in its intended relation to the word *year*. Thus—"and let them be for signs and for seasons, and for *days* and *years*." Again, the natural import of *day* and *night*, one of which was called *morning* and the other *evening*, is exactly declared by the phrase—"the greater light *to rule the day*, and the lesser light *to rule the night*" (ver. 16). And yet again (ver. 18), not only is the same explanation repeated, but is made to define the meaning (in ver. 4) of *dividing the light from the darkness* on the first day. Thus (ver. 18)—"and to rule over the *day*, and over the *night*, and *to divide the light from the darkness*"—while it is said (ver. 4) that—"*God divided the light from the darkness*" on the first day, and called the *light day*, and the *darkness* He called *night:* and then putting them together under the farther designation of *evening* and *morning*, He embraced them in the same collective sense as the word *day* is now employed. Did He divide the *light* from the *darkness* differently on the first and fourth Days? What says Philology?

But Theoretical Geology has involved the first day in such confusion by arresting the progress of Creation after the general announcement in the first verse, we will look still more critically at so important a point as the beginning of time. In the first place, then, the work of that day consisted of two great symmetrical parts, but distinct from each other.

1st. "In the beginning God created the Heaven and the Earth."

2d. "And God said, Let there be light: and there was light."

3d. "And God called the *light Day*, and the *darkness* He called *Night*. And the *evening* and the *morning* were the FIRST DAY."

Now it is evident that the creation of the Heaven and the Earth constituted a part of the First Day's work from the manner in which it is associated with the creation of *light* through the analytical terms, *night*, *darkness*, and *evening*, and *light* and *day*, and the collective term, *first day;* and from what we have seen of the nature of light, the Earth's revolution upon its axis would have begun at once that division of time whose astronomical account is so philosophically delayed till the writer came to

speak specifically of the sun on the Fourth Day; and this, more especially, as other uses of the sun were to be then assigned. There were, therefore, two distinct parts in the work of the First Day which no sophistry can obscure. And since there was no light when the first part was accomplished, it necessarily constitutes the *evening* of the First Day; and by all that is sound in Astronomy the collective term *First Day* means one revolution of the Earth upon its axis; and the most obvious analogy and Unity of Design enforce the conclusion that the term First Day is intended to imply a period of time corresponding with that of each of the subsequent days. Nothing, I say, can be more evident than the fact that the progress of Creation during the darkness which preceded the production of light was of the same duration as that of the other creative days, and that its duration must be determined in that consistent manner. The simple expression alone, therefore, "The *evening* and the *morning* were the First Day," completely explodes "the long indefinite time" which has been assumed to "follow the first verse." Moreover, from what is known of the exigencies of light to vegetation, and the exact adaptation of the sun, it becomes evident that had the writer represented that a year or a month intervened between the creation of plants and the completion of the sun on the Fourth Day, the Record would not be received as the prompting of Inspiration. Hence it is manifest that this consideration, which shows the immediate succession of the Fourth Day after the creation of plants on the Third Day, and the necessity of the immediate completion of the sun, is alone sufficient to establish the certainty of the intended natural length of the several Mosaic Days. And again, as we have seen, the limitation of each of the Six Days to twenty-four hours is farther and conclusively shown by the creation of the vegetable kingdom in a state of maturity, that it might be in readiness for the animal tribes on their appearance, and which is, therefore, significant of the immediate succession of the latter. The first "mist" and "rain" shows the same.

No other demonstration, although we have many others to the same effect, can be necessary to the entire subversion of the whole fabric of Theoretical Geology, which was once on the verge of a precipice when it placed its fossils in a long cycle of ages which it had assumed as following the announcement of "the begin-

ning," in the first verse. But on discovering the "eyes of the Trilobite" (p. 436), it concluded that its primitive animals and plants must have enjoyed the advantages of light, and it so far surrendered this position as inconsistent with the dignity of a "science," and plunged them into the same darkness on shifting its ground to the Six Days of Creation. Those Days then became its great object of assault; and this, by isolating words from all their surrounding context, investing them with false analogies, and in defiance of the Fourth Commandment. It was not contented with limiting itself to the walks of "Science," but it rushed, with Bible in hand, into all the highways and by-ways of society, and struck at the fountain-head of popular education, till Revelation now lies prostrate before it. We hear much of a new translation of the Holy Scriptures to adapt them better to the advanced state of knowledge. But is this revolutionary age auspicious for such an enterprise? What would be the new rendering of the very first chapter? Is it any exaggeration to surmise that it would be in conformity with the subjoined note?*

But Theoretical Geology has supplied the very best proof that the literal meaning of the Mosaic Days is the only one which common sense approves, in its hearty acquiescence in "the long indefinite period" after "the beginning," as advocated by Chalmers, Smith, and other divines; and in the cautious manner in which it began the assault upon the Mosaic Days, when, according to HUGH MILLER, "the *scheme* which was perfectly adequate in 1814 was found in 1839 to be no longer so." Nevertheless, Theoretical Geology by no means abandons its long period of

* I give only examples of the "scientific readings"—

Gen. i., 4. "And God divided the *light* from the *darkness*."

Ver. 5. And God called the *light a long indefinite period*, and the *darkness* He called *another long indefinite period*, and the *evening* and the *morning* were the first *cycle of cycles*.

Ver. 14. And God said, Let there be lights in the firmament of the heaven to divide the *long indefinite period of light* from the *long indefinite period of darkness*, and let them be for signs, and for seasons, and for *long indefinite periods of light*, and for *thousands of years*.

Exod. xx., 9, &c. Six *cycles of ages* shalt thou labor and do all thy work: but the *seventh cycle of ages* is the Sabbath of the Lord thy God: in it thou shalt not do any work, &c. FOR in *six cycles of ages* the Lord made heaven and earth, the sea, and all that in them is, and rested the *seventh cycle of ages:* WHEREFORE the Lord blessed the *seventh cycle of ages*, and hallowed it.—See Gen. ii., 2, 3.

time antecedently to the light of the first day, where it places the stratified rocks that are destitute of organic remains; and this period of darkness is made to justify an extension of the Six Creative Days by calling it the *evening* of the first day. That long "evening," or "night," is then taken as a criterion for the length of the subsequent days; when, if it had any foundation, it should be applied to the following *evenings*, and not to the *day* —thus leaving Theoretical Geology with more than a due proportion of "*darkness*" for the production and growth of plants and animals.

But that is not the worst of it; for the latest geological authority declares that a most luxuriant vegetation flourished even before the creation of the sun. Thus, in a highly applauded Lecture by Prof. F. H. MILLER (Sept., 1869), the "Scientist" said that—

"Coal has been found as far south as Australia; which shows that, in the coal-period the earth's surface was heated from beneath; the SUN NOT HAVING BEEN YET CREATED" (page 31). The growth of plants, however, without light, is always implied when the creation of the sun is assigned to the Fourth Day.

Again, this so-called "Science" assumes that the Seventh Day is a perpetual one, because nothing is said of morning and evening, and then applies it analogically to the other days. The absence of the repetition on the Seventh Day is clearly a matter of common sense, as there was no work done on that day, and its duration was defined by the length of the preceding days, and especially so by the Fourth Commandment. And yet Theoretical Geology delights in the omission, when it would have ridiculed a repetition as a redundant particularity. The following is an example of the logical manner in which an advantage is taken by Theoretical Geology of the omission of evening and morning in the brief reference to the day upon which nothing was done. Thus, the Rev. Mr. MCDONALD, having assumed that the Seventh Day is of incomprehensible duration, remarks that—

"If the foregoing be a correct interpretation of God's Sabbath, it *necessarily and by analogy follows* that the other days of the Narrative of Creation must be taken not in a limited or literal sense, but in a sense corresponding to that of the seventh—the great period of grace and salvation." [!]—CREATION AND THE FALL, 1856.

And yet this able Theologian, who adopts the worst speculations in Geology, charges "Burmeister in Germany, and Agassiz, Morton, and Nott in America," with infidelity because they are among "the opponents of the doctrine of the unity of the human species"—a question which has been left far more open by Revelation to speculative minds than the *meaning* of the Seventh Day, or the length of the Six Creative Days. But Theologians who pervert the import of the Narrative in the foregoing manner may expect greater evidences of a general infidelity than has yet awakened their apprehension. They should consider that their example, in having contributed largely to a disbelief in the Narratives of Creation and the Flood, may possibly be urged in carrying out an assault upon the chapter relative to the Fall of man, which forms the basis of Christianity.

Divines, learned in Theology, continue to render their services in advancing the interests of Theoretical Geology as it respects the length of the Creative Days, notwithstanding its substitution of the development hypotheses for the Creative Acts of Revelation. A late writer of a popular work on "Geology and Revelation" (1870), the Rev. Dr. MOLLOY, has a chapter in which he argues in behalf of "the long indefinite period after the *beginning*," and another chapter in which he concedes to Geology all its requirements in respect to the Six Days, and has an exhaustive inquiry into the meaning of the word יום (*yom*, day), with a special reference to its diversion from its natural import as applied to indicate the duration of the several periods that were formed, respectively, by the succession of evening and morning, or darkness and light.

Another, and also one of the latest of the same school, is the Rev. Dr. J. P. THOMPSON, in his work on *Man in Genesis and in Geology* (1870), in which he says—"I suppose it now to be well understood that neither this word itself (*Day*), nor Biblical usage, nor the *context* here, requires us to understand by a Day a period of twenty-four hours. The term is first applied to the appearing of light after the darkness of chaos. Chaos was the evening, light the morning. But *when* did this darkness begin? And *how long* did the light thus engendered continue? Was this merely a natural day? Why should we attempt to measure this first period by a chronometer which, *according to the narra-*

tive itself, could not have come into use until the fourth day, when the heavenly bodies became visible from our globe, so as to serve for the measurement of times and seasons? In the fourth verse of the second chapter, we have an example of the use of this word Day to cover the whole period of operations included in the seven days of the first chapter; 'These are the generations of the heavens and the earth when they were created, *in the day* that the Lord God made the earth and the heavens.' Here the whole term of creation is comprehended *within one day*. Again, we are told that 'one day is with the Lord as a thousand years, and a thousand years as one day.'"

"Chaos" was not "the evening" in contradistinction to "light, the morning," as supposed in the last quotation; otherwise every successive evening would be a state of chaos. Moreover, the true question, which has been wholly neglected, is not as to the *duration* of darkness before the production of light, but the *time* employed by the Creator in bringing the Universe into its chaotic condition. That determines the length of the first evening, and the time then occupied by the Creator is shown by all the subsequent evenings. As to the *duration of the darkness* anterior to the morning of the first day, it may have existed from all eternity. Nor is there the slightest intimation that the Creator was longer employed in the work of the first evening than in those which followed, nor that there was any pause in the progressive work. As to the "chronometer," if there was light on the first day, that light was in the unfinished sun, as I have endeavored to show, and I suppose that none, or a very few, will assume that the Earth did not *then*, as now, revolve on its axis. And as to our Author's interpretation of the word "Day," I have already shown that the word is too manifestly used for the Creative Days in our specific sense of twenty-four hours, and at other times in our own broad, generic sense, for any farther criticism. Indeed, the very example which our Author offers is an absolute exemplification of this meaning; otherwise, instead of—"in *the Day* that the Lord God made the earth and the heavens," it should have been—in *the Days*, &c. The words "*in the day*" are therefore intended in a comprehensive sense, and to include the Six Creative Days. But that is not all; for this latter phraseology clearly implies that the Six Days of Creation are intended to be

received according not only to their natural import, but as defined by the Historian in a great variety of ways. Our Author's other example—"One day is with the Lord as a thousand years, and a thousand years as one day"—has been often strained to suit the Creative Days to the speculations of Theoretical Geology. That expression, however, has no relation to the question, but was intended by Peter as a contrast between time and eternity, and between finite beings and the Infinite. It is precisely of the same import as the Psalmist's expression—"A thousand years in Thy sight are but as *yesterday when it is past*, and as a watch in the night." Theoretical Geology must show better cause than that, or abandon the Narrative as irreconcilable with its hypotheses. But there are numerous instances in the Bible where the word *Day* is intended to express an indefinite period of time. Indeed, the phrase "*In the Day*" occurs not less than seventy-five times, and the phrase *In the Days* forty-four times, where they are employed in an indefinite sense; nor will any one seriously insist that in either instance it carries with it the same meaning of Day as employed throughout the first chapter of Genesis. Its intended meaning in all the cases is readily determined by its connections with other words or sentences. Moreover, it is admitted by all who are conversant with the subject that the Hebrews understood by the word *Day*, as employed in the first chapter of Genesis, that it consisted of twenty-four hours. And so always in other instances where it occurs in connection with the words *evening* and *morning*. Bishop NEWTON, on the *Prophecies*, gives an example in illustration. Thus—

"The answer is (Dan. viii., 14)—'*Unto two thousand and three hundred days; then* shall the sanctuary be cleansed.' In the original it is—'*Unto two thousand and three hundred evenings and mornings*'—an *evening* and *morning* being, in Hebrew, *the notation of time for a day*. Afterwards it is said, '*evening* and *morning*' (ver. 26)."

It appears, therefore, that the word *Day* is used in the Narrative of Creation in the three obvious senses which prevail at the present time. In the first chapter it is used analytically, and stands for "light," as "night" does for "darkness;" 2d, in a compound sense, embracing both "light" and "darkness;" 3d,

in the second chapter (ver. 4), it is employed to denote that *era* in time when "the Lord God made the earth and the heavens."

Besides what I have said of an equally exact definition of "evening" as of the "morning," the order of succession as to "darkness" and "light" is strictly predicated of the order of events; and had it been "morning" and "evening," as required by Theoretical Geology, the arrangement would have contradicted the premises upon which it is founded, and given to Geology a triumphant stand-point. No: the Creator began his work in darkness, and launched the Universe into existence during the last few hours of that inexpressible void of light. That portion of the pre-existing darkness was the "evening" or "night" of "the first day," and when "light" was created it was "divided from the darkness" or antecedent "night," and formed the other division of the day, which was continued till the evening of the second day. Nor can any perversion of words show that the *time employed* by the Creator in the first stage of his work, and which he designated as the "evening" or "night" of the "first day," is not as good a measure of a definite portion of time as the word "day;" nay, even more, since the "evening" and "night" are not susceptible of any equivocal meaning. Indeed, it is manifest that even a fictitious writer would not have been guilty of the inconsistency of implying that the first morning and evening, and the first day, were of any longer duration than the subsequent, or of intending a disparity in any of the days that would have contradicted his own explanations, or the obvious import of words. Nor can we fail of surprise that it should not have been readily seen that the first work of Creation may just as well have preceded the usual period of daylight as that the former should have followed the latter; while, also, had the order been reversed by the Sacred Historian, he would not only have thrown the first day into confusion, and therefore all the other days, but he would have represented the Creator as violating some of the most important philosophy of Design. Would it have been any more intelligible, or more consistent with the "canons of criticism," or with the compact style of the Narrative, to have said, *In the beginning of the first day*, when the fact is embraced in the statement that "the evening and the morning were the first day?"

But what disposition shall be made of the Fourth Commandment? especially as two reasons, defining specifically the length of the Creative Days, are assigned for keeping holy the Sabbath Day, namely—"For *in six days* the Lord made heaven and earth, &c., and *rested* (desisted) the seventh day: WHEREFORE the Lord *blessed* the seventh day, and *hallowed it*." (See Gen. ii., 2, 3; and *Note*, p. 485.) Nothing but the sophistry of ambition or infidelity can approach this Divine exposition for the purpose of distorting its meaning. I may also insist, in behalf of the cause which I advocate, that it is vain to attempt a mutilation of the plain meaning of the Narrative of Creation by digging at a "Hebrew root." The context, I say and I show, everywhere explains the Divine meaning. It will, however, be useful as well as amusing to observe still farther the special disposition which Theoretical Geology makes of the Sabbath Day (see p. 487, &c.). As is always the case with innovators upon the Narrative of Creation who desire a hearing from the religious part of the community, the Fourth Commandment is a troublesome difficulty. There are several Authors before me who supply, in their concurrent interpretation, a very good example of the *modus operandi* of Theoretical Geology in disposing of problems of this nature, and I shall quote their joint disposal of the subject in the language of the most renowned and adroit in the "Science." The reader will not fail to observe the "presumptions," the substitution of "periods" for "days" (according to the parody in *Note*, p. 485), and also the singularly logical and demonstrative nature, as well as the aptness, of the parallel which is presented to his imagination between the supposed duplicate meaning of the *Sabbath Day* and the "*huge earth and a geographical globe.*" Thus, then, the long distinguished expounder of geological problems, of whom it was said by the Rev. Dr. CHALMERS, that "since Scott's death he was the greatest Scotchman that was left:"

"God, the Creator," says HUGH MILLER, "who wrought during SIX PERIODS, rested *during* the seventh; and as we have no evidence whatever that he recommenced his work of Creation, as, on the contrary, man seems to be the last formed of creatures, God may be resting still. The *presumption* is strong that this Sabbath is an *extended period*, not a natural day, and that the *work of redemption* is his Sabbath-day's work. [!] And so I can

not see that it *in the least interferes* with the integrity of the reason for the Fourth Commandment to read it thus—'Work during SIX PERIODS, and rest on the *seventh;* for in SIX PERIODS the Lord created the heavens and the earth, and in the SEVENTH PERIOD he rested. [See *Note*, p. 485.] The Divine periods MAY HAVE BEEN very great, the human periods very small; JUST AS *a vast continent or the huge earth itself is very great, and a map or geographical globe very* SMALL." ! !

And yet is all this one of the ablest perversions of the subject which Theoretical Geology has yet attempted, while, also, it is a good example of the inductive philosophy of the "Science," and, as we shall have seen, of the common geological mode of disposing of the Sabbath Day and of the Fourth Commandment. (See p. 487.) But what will the unskilled in this management of words, the masses of mankind, who are the main objects of Theoretical Geology, say to this? Besides, it is the sheerest nonsense to deduce not only a day of *twenty-four hours* and *a geological age* from the same statement relative to the seventh day, but two propositions also of totally different import. That is to say, Theoretical Geology assumes that God, by the Fourth Commandment (which is absolutely relative to man alone), enjoined upon man a rest of twenty-four hours once in seven days, *because* God had accomplished *His* work in six *geological eras*, and therefore, having nothing farther to do, "rested" (ceased) from His work at the end of that time; while, also, He intended by this same decree (alone relative to man) to command himself to rest for a "*Sabbath age*," but without the slightest intimation to that effect.

Such, however, has become the common doctrine even among Theological Geologists, of which examples have been already presented. The Rev. Dr. MOLLOY, one of the latest writers, while defending, as we have seen (pp. 443, 487), the assumed long indefinite period after "the beginning," and supplying an elaborate discussion upon the word day, with a view to its unlimited adaptation to the uses of Theoretical Geology, turns also to its advantage the seventh day, of which he thinks there is no end. Like all others who attempt to explain away the obvious meaning of the first six days, he makes no reference to the three several modes in which the inspired Writer defines and protects

the true meaning of the word יום, *yom*, or *day*—that is, by "evening and morning," "night and day," "darkness and light"—but wanders over the Bible in pursuit of examples in which the word is as obviously employed in its indefinite sense. He does even more than this, and in such a novel manner as to render his construction worthy of notice. Thus, he assumes for the word different latitudes of time on the several Mosaic Days, and compounds them into eras, according to the supposed exigencies of Theoretical Geology. He says:

"The reader must not think it AMISS, in this distribution of the Mosaic Days, that FOUR out of the SIX are *crowded together into* ONE GEOLOGICAL AGE, while EACH of the other TWO has AN ENTIRE AGE assigned to itself. If the Days of Creation were indefinite periods, there is *no incongruity* in supposing that one may have corresponded to *a longer*, another to *a shorter* interval in the history of our planet." And as to the seventh day, he remarks that—"The six days of Creation are *contrasted* with the seventh day of God's rest; and this seventh day of God's rest is unquestionably a long period of undefined duration. [And now for the logic.] From all this *it is obvious* to conclude, that we may FAIRLY adopt this mode of interpreting the Mosaic Days, IF IT WILL ASSIST us in reconciling the received conclusions of science with the truths of Revelation."—MOLLOY'S *Geology and Revelation*, 1870.

I have shown how the duration of the seventh day is to be interpreted by that of the preceding days. It is simply a day of pause, and surrounds itself with the preceding six as the basis upon which it is founded, both as to duration and sanctification. This is declared not only at the time when it was hallowed in commemoration of the past, and sanctified to the glory of God for what He had done, and as a brief period of uniform recurrence allotted to the highest interests of mankind, but is farther confirmed by the Fourth Commandment in nearly the verbal language of the original promulgation, and accompanied by a repetition of the reasons which had been specifically predicated of the natural duration of the Six Creative Days.

I say, therefore, again and again, that not only the Minister of Religion, but every other person of common understanding, must take along "*Evening*," "*Darkness*," and "*Night*" with his defi-

nition of the word DAY as employed by the inspired Writer in indicating the duration of the Creative Days; and what then becomes of "the long indefinite periods?"

The question naturally arises, after all we have now seen, whether it was designed by the Creator that his account of His works should be intelligible to the masses of mankind for whom it was designed, as admitted by all, or that it should be so ambiguous as to delude all but the learned in Geology, and that its true interpretation should depend upon the *ruins* of Creation, and should await the slow process by which these ruins are exhumed, and then consigned to the ever fluctuating speculations of Theoretical Geology. Or, if the Record of Creation be not clearly and readily intelligible, why was it delivered indiscriminately to mankind? Why was more revealed than that—"*In the beginning God created the heaven and the earth?*" Why all the details not only in the first chapter, but the explanatory ones in the second, since the *first verse* pronounces the dependence of all things upon the Creator?

The Rev. Dr. Thompson, in his "*Man in Genesis and in Geology*," remarks: "How was this language understood by those to whom it was originally addressed?" He then quotes Max Muller's "*Chips from a German Workshop*" as saying that—"The great majority of readers transfer without hesitation the ideas which they connect with words as used in the nineteenth century to the mind of Moses or his contemporaries, forgetting altogether the distance which divides their language and their thoughts from the thoughts and language of the wandering tribes of Israel."

It may be safely said of the foregoing that there never has been a time when the expression "Evening and Morning," and, as the Creator defines it to mean, "Night and Day," and "Darkness and Light," has been understood in any other possible sense than as consisting of one revolution of the earth upon its axis—and, least of all, that God would have prompted such a phraseology in three corresponding terms if he had meant to imply by it "a long indefinite period;" and a like affirmation may be made of the precise, unvarying nature of every other part of the Narrative. Nor will the certainty of this be affected by the assumption that it was left to the discretion of Moses to communicate the Narrative in such language as seemed to him expedient, nor

by regarding the Narrative as a joint production of the Creator and his Amanuensis, as supposed by MOLLOY in his "*Geology and Revelation;*" who says that—

"What we maintain is simply this: that the Sacred Writer recorded faithfully, *in language fitted to the ideas of his time*, that portion of Revelation which was committed to him; and, in the accomplishment of this task, *made such a choice of words and phrases, under the guidance of the Holy Spirit*, to whom all truth is present, as to set forth *plainly* those facts that were unfolded to him, without introducing any error about those facts of which he was ignorant."

But all these attempts to affect the plain meaning of the Narrative are wholly fruitless, since its meaning does not depend in the least upon the Writer or Prompter, or the ignorance or opinions of the people of the era when it was promulgated, but upon the radical, unchangeable meaning of words and phrases, whether expressed in Hebrew, or English, or any other language. We have seen, moreover, that the Narrative embraces one stupendous, consistent whole — precise, *scientific*, and consistent in all its details, from the time when the Word went forth "in the beginning" till it ceased on the seventh day. We have seen that the demands of Philosophy, as they lie embosomed in the sciences, sustain the Record of Creation in every detail, and that, had there been a single deviation in any part of the Narrative from its present exact meaning, that same Heaven-born, uncompromising Philosophy would have pronounced it a clumsy fabrication by man. The first chapter defines Creation in a phraseology that shall be most intelligible to all mankind; and the second, or chapter of greater details, expounds the exact meaning of whatever may appear ambiguous to a critical mind in the first chapter of more general statements. But all the statements are made in the most natural and intelligible manner, and are adapted to the illiterate as well as the man of science, to the child as well as the adult; and it is only the speculatist who would distort the meaning. It was also written, I repeat, before science had begun to dawn, when all was ingulfed in ignorance and superstition—save only the beams of light which were emitted from Heaven upon a chosen few. How otherwise could Moses have known that the laws of gravitation required the

simultaneous creation of the universe? And do not the subsequent details render it certain that he would have represented the Earth as existing alone till the fourth day; considering, especially, how he has been misunderstood in this important matter? Whence came his knowledge of those systematic, progressive Designs which form the various subsequent parts in the order of creation? Whence, that the "Spirit of God" should be instrumental in the reduction of the earth and the heavenly orbs from a state of chaos to their perfected condition? (See Appendix I.) Whence, that light should have been created before the vegetable kingdom, considering, particularly, how the scientific of the nineteenth century have placed vegetation under the auspices of darkness? (Chap. XIII., &c.). How came he to know that plants should precede the creation of animals? How, that animals should precede man? How, that they were made out of the dust of the ground? How, that the "firmament" or atmospheric air should anticipate vegetation? How, that it should "divide the waters from the waters?" (p. 470). How, that Unity of Design required the completion of the sun, moon, and stars, on the fourth day? Why so much detail in relation to the earth and its inhabitants, and a brief allusion only to the other heavenly orbs? But I will not pursue this recapitulation. The very *order* of Creation alone, independently of all the other internal proof supplied by the Narrative, is conclusive of its revelation by the Divine Being.

Nevertheless, we have seen that it is a fundamental point in Theoretical Geology that there is no science in the Narrative of Creation; that it was simply intended "to inform us by whom the world was made;" that its language is addressed to the popular opinions and ignorance of the primitive days; and that of these convenient assumptions "Science" predicates the right to interpret the language according to the suggestions or requirements of its own hypotheses. This, indeed, has formed the main entering-wedge from immemorial time; and I present the following quotation, not only that it may be seen how a writer upon the "*Structure of the Globe*," in the last century, while describing the attitude of Theoretical Geology at his own time, portrays the advances it has made at the present day, but also for its admirable comments. Thus—

"*The ambition of framing general systems tyrannizes the most sober heads*, and attaches us to certain ideas, to which, without perceiving it, we strive to make all Nature pay homage, even where she's most stubbornly opposite." "To set her at *variance* with the *assertions* of a supposed inspired writer was no small object. The short account he has given us of the Creation runs counter to the opinions said to be framed on the unerring proofs of Nature by many celebrated philosophers." "Yet I am still aware that, however probable any explication of the first chapter of Genesis given or to be given may be, it will by some be peremptorily rejected upon the old plea that, its language being adapted to the intelligence, or, in other words, to the vulgar prejudices of an ignorant people, we are not there to look for that exactness and precision required in philosophical discussions where that science was never meant to be inculcated. But I will venture to assert that the *veracity of its Author can not be screened under the subterfuge of condescension to vulgar errors.* He announces *facts as positive truths. These are not alterable in compliance with language or opinions.* If they are true, they may as yet be unresolved, but *can not be irresolvable by the real laws of Nature.*"—HOWARD'S *History of the Earth and Mankind*, &c., 1797.

On contemplating the details of the Narrative of Creation, which has for many thousand years engaged the pens of the inspired and the erudite, and received the sanction of our Lord and his disciples, I shrank almost instinctively from the magnitude of the inquiry when undertaken in my former work on *Theoretical Geology;* nor should I have embarked upon it but from the conviction that I should not fail of detecting a very wonderful display of an exact philosophy, which is utterly beyond the conception of the most enlightened mind of the present day, and all embraced in 796 words; although covering the whole ground upon which Astronomy, Physiology, Chemistry, and all the natural Sciences are founded, and surpassing them all in the precision of its philosophy; nor is there *one superfluous word, one word too few, nor one misplaced.* All this I have endeavored to make apparent.

Among the variety of internal proofs of its Divine dictation with which the Narrative of Creation abounds, its extreme brevity is one of the most impressive; especially when associated with

its precision, perspicuity, absence of all defense or explanation of what is intended for the faith of mankind, yet explanatory of any words of more than one meaning—as "morning and evening," "day," &c.—its limitation of all the details to the things of this earth, its exact and universal philosophy, its Unity of Design throughout all the details, the specific proof of its Divine Authority that is impressed upon particular statements—as those relative to the Soul, the Principle of Life, the materials of which man was formed, &c. But to appreciate fully the evidence supplied by the compact brevity of the Narrative we must represent to ourselves what would have been the course of the writer had he been employed about a work of fiction, and this may be readily done by looking at the habits of all ancient and modern writers who have taken for their themes the sublime or romantic. The author of the Book of Job imbues his realities with poetic inspiration; Homer, Virgil, &c., exhaust their own creations; Milton elaborates into Paradise Lost a simple statement relative to Adam and Eve, and who shall tell the multitude of volumes that have been written upon the same text? The world has abounded with writers who have found their highest gratification and their best interest in addressing the imagination; and yet here is a man of lofty genius employed about a Narrative of the beginning of all things—the Universe, the first appearance of man and all organic nature, the universal Flood, and the preservation in a vessel of more than 68,000 tons; the origin of sin, &c., and yet it may be all read and understood in less than half an hour. And how, on the other hand, is it with Theoretical Geology when occupied with its "creations and extinctions," its "primordial cell," its "reign of insects," "reign of saurians," "reign of mastodons," "prehistoric man," "the Stone Age," and whatever else will render the imagination tributary to its schemes? These subjects have been expanded into volumes that would form a library of very imposing dimensions. In the mean time, for the simple reason that the bones of man, who has the sagacity and ability to avoid torrents of water or avalanches of land, are not found imbedded in the rocks, this earth is given over for millions of years first to a state of desolation, and then for other millions to a worthless occupation by plants and animals, till within a few thousand years man is admitted upon the stage to wonder at the strange dispen-

sation of Providence in having detained him so long from the enjoyment of those bounties which were alone intended for him. But when the Narrative of Creation shall be again restored to the confidence of mankind, the main foundation of modern infidelity will be "scattered to the winds." Such, however, is the nature of error and infidelity that, when once impressed upon the public mind, they can be arrested only by great revolutions; and I may reiterate now with greater apprehension than thirty years ago, that when nations have begun to trample upon the past, to reject its experience, and to strike out new systems of observing nature, it has been the most certain presage of approaching imbecility, and of that ultimate downfall to which all are destined. When the great revolution shall have reached the genius of Philosophy —το κρατιστον της φιλοσοφιας—the last phial of wrath is emptied, and that nation is irretrievably gone.

A few years ago there came from Great Britain an encouraging voice in behalf of the Holy Scriptures. But how little has been the weight of conservative science as then exerted may be inferred from the preceding pages. As a memorial in behalf of our age, I shall contribute towards its preservation by transferring to this work a summary view of what was then in progress among many leading British philosophers who were as earnest in behalf of science as of Revelation, and which will be so inferred from the following appeal, if not to a religious faith, at least to the dignity of science. The declaration made its appearance in September, 1864, and was signed at that time by more than two hundred; of whom thirty were members of the Royal Society, and forty of the Medical Profession. Here is the document:

"We, the undersigned, students of the Natural Sciences, desire to express our sincere regret that researches into scientific truth are perverted by some in our own times into occasion for casting doubts upon the truth and authenticity of the Holy Scriptures. We conceive that it is impossible for the Word of God as written in the book of nature, and God's Word written in Holy Scripture, to contradict one another, however much they may appear to differ. We are not forgetful that physical science is not complete, but is only in a condition of progress, and that at present our finite reason enables us only to see as through a glass darkly; and we confidently believe that a time will come

when the two Records will be seen *to agree in every particular.* We can not but deplore that Natural Science should be looked upon with suspicion by many who do not make a study of it, merely on account of the unadvised manner in which some are placing it in opposition to Holy Writ. We believe that it is the duty of every scientific student to investigate nature simply for the purpose of elucidating truth, and that if he finds that some of his results appear to be in contradiction to the written Word, *or rather to his own interpretations of it*, which may be erroneous, he should not presumptuously affirm that his own conclusions must be right, and the statements of Scripture wrong. Rather leave the two side by side till it shall please God to allow us to see the manner in which they may be reconciled; and, instead of insisting upon the seeming differences between science and the Scriptures, it would be as well to rest in faith upon the points in which they agree."

And where now is all this sound of alarm? Let the British Association for the Advancement of Science answer. Serious discouragements were at that time encountered, examples of which occur in the public protests which were made by Sir JOHN HERSCHELL and Sir JOHN BOWRING when they declined their signatures to the appeal.

But there is a far greater testimony on record — running through the Ages, and assuring us that, with rare exceptions, all the most eminent in ancient and modern times who have been truly endowed with genius, or have been informed in all the sciences, have ascribed the origin of animate and inanimate nature *directly* to the Creative Power of God, and in no respect to physical laws, and have avowed their belief in a Soul and its immortality. Moreover, in Christian times, the same class of mankind have been devoutly convinced of the truth of every part of the Holy Scriptures. The opposite party have been sciolists. For the most part, they have simply misapplied the discoveries of others, and betray flagrant violations of logical reasoning and an unrestrained imagination. Their cause is *naturalism*, their criterion the compass of human intellect, their philosophy the creation of their own imaginations. Miracles, Creation by a Personal God, are not consonant with that philosophy, mere delusions upon human credulity. VOLTAIRE they rightly claim

as a man of genius; but he was "every thing by turns and nothing long." "Ever inconstant and wavering, he was a Freethinker at London, a Cartesian at Versailles, a Christian at Nancy, and an Infidel at Berlin." Here, then, you say, is LAPLACE —eminent in science. But his scientific acquirements were limited to Geometry and Astronomy; and it was said of him by Napoleon that—"He never viewed any subject in its true light; he was always occupied with subtleties; his notions all problematic; and he carried the spirit of the infinitely small into the Administration." Who would now respect Sir CHARLES LYELL'S opinions upon any question relating to Creation or the Flood, after "abandoning, late in life [in behalf of Darwinism], the doctrine of special creations, which he had for forty years regarded as one of the foundation-stones of a work that had given him the highest position attainable among scientific writers?" Again, the eminent Author of the *Reliquiæ Diluvianæ* occupies the same position in having abandoned all his vastly-accumulated proof in behalf of the Sacred Narrative and applied it towards the speculations of Theoretical Geology.

Finally, the Sciences have made such advances that innovations upon established principles can alone satisfy an inordinate ambition; especially when the field to be explored demands the labor of many years. Consider what has been regarded as one of the most ready comprehension to serve as a basis for a stupendous system of laws—Geology. No one can pursue the inquiry in its connection with fossil exuviæ, and with a reference to scientific principles, or to the origin of living beings, without an intimate knowledge of Comparative Anatomy, and of the profound science of Physiology. With that knowledge he will at once perceive that the fossil remains represent nothing but what were once component parts of the present organic kingdoms, and that in no circumstance whatever of an organic nature are they distinguished from the existing races of animals and plants. He would meet, also, with a labyrinth of facts and principles that would assure him as perfectly of the creation of man and animals in a state of maturity, both of body and mind, as he is conscious of his own existence. Or should the Geologist address his inquiries to the constitution of the Earth with a view to its origin, he must be conversant with the science of Chem-

istry; and this would lead him to the knowledge that by no possibility could the primary rocks have emerged from a chaotic state into their organized condition through the forces and laws alone that are impressed upon matter, or from a state of igneous fusion. Moreover, with all this information he would readily perceive that Geology can aspire at nothing more than an accumulation of facts that may be converted to a variety of the most useful purposes, but which supply no foundation whatever for scientific laws or principles. But the Geologist, to accomplish all this, must look for amusements in laborious study. What is said by Tacitus of the Poet, in his *Dialogue concerning Oratory*, is far more applicable to the difficulties attendant upon the Sciences—even their individual pursuit, when studied in its connected relations with others. "It must not be forgotten," says Tacitus, "that the Poet who would produce any thing truly excellent in the kind must bid farewell to the conversation of his friends; he must renounce, not only the pleasures of Rome, but also the duties of social life; he must retire from the world, as the Poet says, 'to groves and grottoes, every muse's son.' In other words, he must condemn himself to a sequestered life in the gloom of solitude."

Having now completed my last remaining object—an analysis of the Narrative of Creation—in behalf of the Soul, with the exception of what will appear in the *Appendices* with a farther view to the literal interpretation of that Record, as well as of the Narrative of the Flood, I shall proceed to the demonstration of the Instinctive Principle, when other considerations will arise that go to confirm the substantive existence and self-acting nature of the Soul.

CHAPTER XV.

PHYSIOLOGY OF INSTINCT, ACCORDING TO DISTINGUISHED WRITERS.

THE opinions which have prevailed in regard to Instinct have generally been vague and hypothetical, with the exception of such as deny the existence of the Soul. *Materialism* knows no distinction, but attributes all their manifestations equally to the mere workings of matter. Of more equivocal doctrines the distinguished J. MASON GOOD, M.D., supplies, in his "*Book of Nature*," a history of such as have been entertained, and of which the following is a summary:

"There are various actions and trains of actions occasionally to be met with among mankind, but more frequently and more strikingly among other animals, which indicate the employment of certain definite means to obtain a definite end, without the intervention of that chain of thought which characterizes *Reason*, and which have hence been ascribed to a distinct principle that has been distinguished by the name of *Instinct*." "The modes of accounting for instinctive acts have been various, and in the utmost degree unsatisfactory. In a general survey they may be resolved into three classes: *first*, those hypotheses which ascribe the whole to the operation of body alone; *secondly*, those which ascribe it to mind alone; and, *thirdly*, those which derive it from a substance of a mediate nature between the two, or attribute it partly to the one and partly to the other."

"I. It was the opinion of Des Cartes that brutes are mere mechanical machines; that they have neither ideas nor sensation; neither pain nor pleasure; and that their outcries under punishment, and their alacrity in pursuing an enemy or devouring a meal, are produced by the *same sort of force* which, exerted upon the different keys of an organ, compels its respective pipes to give forth *different sounds*. And a great part of Cardinal Polignac's very elegant Latin poem, entitled *Anti-Lucretius*, is written in di-

rect support of this whimsical hypothesis." "Under this view of the subject all instinctive actions were, of course, referred to a principle of body, or gross tangible matter, not endowed with peculiar or exclusive properties; and wherever any thing of the same description was to be found among mankind, it was instantly separated from all connection with intelligence, and referred to the same source." "The ideas of Dr. Reid, who has expressly written upon this subject, do not appear to be very perspicuous; yet he obviously espouses the doctrine of a mechanical principle of animal actions; and the actions which are resolvable into this principle are, in his opinion, of two kinds, those of instinct and those of habit. Instinct is with him, therefore, as well as with Des Cartes, a property of body or gross matter alone, unendowed with any peculiar powers, and merely operated upon by a combination of mechanical forces.

"II. In direct opposition to this corporeal hypothesis, Mr. William Smellie and Dr. Erasmus Darwin have contended that instinct is altogether a *mental* principle, the brute tribes possessing an intelligent faculty of the very same nature as mankind, though more limited in its range. From this point, however, these two physiologists disagree, and fly off in opposite directions; the former contending that Reason is the result of Instinct, and the latter that Instinct is the result of Reason."

"III. There is a third class of philosophers who, sensible of the difficulty of the case, have endeavored to get over it by contending that instincts are of a mixed kind; that they either originate in a power which holds an intermediate nature between matter and mind; or else are in some instances simply material, and in others simply mental. The learned Cudworth belonged to the first of these two divisions, and may be regarded as having taken the lead in the scheme which it develops. This profound metaphysician was so strongly attached to the Platonic theory of the creation of the world, that he strove, with the full force of his mighty mind, to restore this theory to general vogue. He conceived that all instinctive powers might be satisfactorily resolved into the operation of Plato's incorporeal form, or an active plastic nature, which exists throughout the world independently of pure mind and pure matter." "At the head of the second division of the last class of philosophers to whom I have re-

ferred we may perhaps place M. Buffon, who, not choosing to allot to animals below the rank of man the possession of an intelligent principle, kindly endowed them with the *property of life* —which Des Cartes had morosely withheld, by contending that they were mechanical machines alone—and very obligingly allowed them to possess a faculty of distinguishing between pleasure and pain, together with a general desire for the former, and a general aversion for the latter. And having thus equipped the different tribes of brutes, he conceived that he had sufficiently accounted for the existence of instinctive actions, by leaving them to the operation of this distinguishing faculty upon the mechanical properties of their respective organs." (See Chapter VI., *Equivalence of Forces.*) "M. Cuvier has taken a ground still different from any of these philosophers. He has not, indeed, expressly written upon the subject, but in a very accurate description of a somewhat singular orang-outang he sufficiently unfolds his opinion that Instinct consists of ideas which do not originate from sensation, but flow immediately from the brain, and are truly innate."

Our Author, having thus set forth the diversity of opinions entertained by Philosophers as to the nature of Instinct, remarks that—"Nothing, therefore, is clearer than that the principle of instinct *has hitherto never been explicitly pointed out*, nor even the term itself precisely defined. It has been derived from mechanical powers, from mental powers, from both together, and from an imaginary intermediate essence, supposed equally to pervade all embodied matter, and to give it form and structure. It has been made sometimes to include the sensations, sometimes the passions, sometimes the reason, and sometimes the ideas. It has been sometimes restricted to animals, and sometimes extended to vegetable life."

Our Author proceeds next to deliver his own opinion of Instinct, which he designates as "a new view of the subject;" and it is remarkable that so good an observer, and so able a reasoner, avows his belief that the Instinct of animals is nothing more than "the operation of the PRINCIPLE OF LIFE," because they are not endowed with the rational faculty. Thus he says:

"The law of Instinct, then, is the law of the Living Principle; instinctive actions are the actions of the living principle, which is

either that power which characteristically distinguishes organized from unorganized matter, and pervades and regulates the former as gravitation pervades and regulates the latter, uniformly operating by definite means, in definite circumstances, to the general welfare of the individual system or of its separate organs; advancing them to perfection, preserving them in it, or laying a foundation for their reproduction, as the nature of the case may require. It applies equally to plants and animals, and to every part of the plant as well as to every part of the animal, so long as such part continues alive. It is this which maintains from age to age, with so much nicety and precision, the distinctive characters of different kinds and species, which carries off the waste or worn-out matter, supplies it with new, &c. It is hence the strawberry travels from spot to spot, and the cod or the cuckoo, with a wider range, from shore to shore, or from climate to climate."

The foregoing identification of Instinct with the Vital Principle, and which has been advocated by others, was probably suggested by the precision with which the former operates. But it is essentially materialistic in respect to animals; and from what will be shown of the analogies between Instinct and Reason, if our Author's construction had any just foundation, it would be applicable to man as well as to animals—an inference which he had not contemplated. There are, however, many fundamental distinctions between the Principle of Life and Instinct; one of the most obvious of which is, that the former is always moved into action by physical causes, and whenever they cease to operate the Principle of Life either perishes or becomes quiescent; while, in respect to the Soul and Instinctive Principle, however much they may be brought into action by physical causes, as in sensation, their action advances in manifold ways after the physical exciting causes are withdrawn and all sensation ceases. The Soul and Instinct are, also, as we have seen (Chapter II.), among the causes which bring the Principle of Life into action, as witnessed of the Will in voluntary motion, and of the Passions in their action upon the heart, blood-vessels, stomach, &c. This, however, is very different from the natural stimuli that are designed for Organic Life. The blood, for example, is the natural stimulus of the Principle of Life in the heart and arteries, and if

the action of this stimulus be withdrawn life becomes at once extinct. Moreover, the Soul, as in the processes of Reason, may institute its own actions, and in entire independence of any remote cause. This is also true of the Instinct of animals after it is excited into action by suggestions coming to the brain from remote causes through the medium of the senses, and these suggestions may be of a very slender nature. Instinct, then, appropriates the suggestions, and carries them out according to its peculiarities in different species of animals.

But while physical causes are indispensable to maintain the actions of the organism in plants and animals, and without which their life would perish, or at most can exist in a state of quiescence in the seed and egg only, they are in no respect necessary, by their direct action, to the maintenance of the Intellectual and Instinctive Faculties, and in all their vigor. While organic life is unimpaired, Reason and Instinct may be perfectly quiescent, and yet summoned into action by causes which have no relation to organic life, as is always the case with impressions made upon the senses. Nay more; while the organism is as much in motion, and excited to action by physical causes, during sleep as in the waking hours, the Soul and Instinct are invigorated by the absence of all their peculiar exciting causes during the same period; nor will the agents or causes which maintain the organs of organic life in the performance of their functions bring into action either Reason or Instinct. And I may advert again to the absence of all analogies between the results of rational and instinctive processes and those of organic actions, and to the manifest limitation of the Soul and Instinctive Principle to the brain and nerves as the organs through which their functions are carried on; while plants, which possess the same organic functions as animals, have no nervous system. From all which it is abundantly evident, and, as will farther appear, that the Instinct of animals is not only totally different from the Principle of Life, but, so far as now shown, evinces an alliance to the Rational Faculties of man.

Among the variety of doctrines relative to Instinct, that of Dr. HARTLEY is worthy of attention. We have seen in Chapter V. that this eminent writer supposes that the phenomena of the Rational Faculties depend upon vibratory motions in the brain and nerves, and he carries this materialistic explanation to the in-

stinctive manifestations of animals. Thus, in his "*Theory of the Human Mind*," he says:

"If the doctrines of vibrations and association be found sufficient to solve the phenomena of sensation, motion, ideas, and affections in men, it will be reasonable to suppose that they will also be sufficient to solve the analogous phenomena in brutes. And, conversely, it seems probable that an endeavor to apply and adapt these doctrines to brutes will cast some light and evidence upon them as they take place in men. And thus the laws of vibrations and association may be as universal in respect of the nervous systems of animals of all kinds, as the law of circulation is with respect to the system of the heart and blood-vessels; and their powers of sensation and motion be the result of these three laws, namely: circulation, vibrations, and association, taken together."

The eminent Mr. LAWRENCE, in his "*Lectures on Physiology*," supplies an example, in the following assumption and sophistry, of reasoning from the Instinct of animals to the materialistic doctrine of the Soul. Thus he says:

"If the intellectual phenomena of man require an immaterial principle superadded to the brain, we must equally concede it to those more rational animals which exhibit manifestations differing from some of the human family only in degree. If we grant it to these, we can not refuse it to the next in order, and so on in succession to the whole series—to the oyster, to the sea-anemone, the polypi, the microscopic animalcules. Is any one prepared to admit the existence of immaterial principles in all these cases? *If not, he must equally reject it in man.*"

But Mr. Lawrence shall show the fallacy of his premises in imputing to animals manifestations of reason "differing from some of the human family only in degree;" for, as in most cases where an Author is at fault about principles, Mr. Lawrence contradicts himself. Thus, in another place he says that—

"Although the external senses of brute animals *are not inferior to our own*, and though *we should allow some* of them to possess *a faint dawning* of comparison, reflection, and judgment, *it is certain that they are unable to form that association of ideas in which alone the essence of thought consists.*"

The distinguished chemical physiologist, Baron LIEBIG, whose

materialistic opinions have been noticed in Chapters IV. and VI., supplies in the following characteristic doctrine a good exemplification of the speculative views upon Instinct, and of the manner in which Instinct is confounded with Reason. When adverting to the action of tea and coffee, he says—

"We must presuppose that if these stimulants did not satisfy some *powerful want of our organization*, man would hardly *take the trouble to seek them;* and that instinct should in so wonderful a manner, among a countless number of plants, choose just such as produce substances inducing the same effect, shows that one and the same *gap exists in the nutrition of man* in all countries and zones."

It now remains to advert to the absurdity, in the foregoing quotation, of assimilating the physiological action of plants to man's imbibing propensity for stimulants, or in supposing that the luxuries of tea and coffee came into use through the promptings of Instinct. Our only farther comment is in the form of an interrogatory—whether our Author's philosophy is applicable to the analogous partiality for tobacco and alcoholic stimulants? What "powerful want of our organization," or what "gap in the nutrition of man," leads him "to take the trouble to seek them," and to consume them, "in so wonderful a manner?"

It will now be interesting to observe the contrast to the foregoing opinions as supplied by other profound thinkers. Thus, Saint Pierre remarks, in his "*Harmonies of Nature*," that—

"Vegetable products possess nothing fit to be compared to the sensitive and intellectual faculties of animals. Yet some philosophers, among others Descartes and Malebranche, have presumed to rate the animal below the vegetable kingdom. They think proper to assert that animals are passive machines, and that it would be wrong to say the same of vegetables. When Malebranche was desired to account for the cries of a dog when struck, he thought proper to compare them to the sound of a bell when struck in the same manner. To prove this, he one day, in the heat of argument, unluckily killed, by a kick, his own bitch; and Rousseau, in adverting to this cruel imprudence, said to me, 'When we begin *to reason* we cease *to feel.*' The expression throws a great degree of light on the nature of the Soul of beasts, and on ours, as far as their properties are in common.

It shows that our Soul has two very distinct faculties—understanding and feeling. The former arises partly from experience, the latter from the fundamental laws of nature. Both are in harmony in animals, and direct them to a good end." "But the Soul of animals is gifted with a faculty of more importance than its portion of sensation or intellect; it has a kind of moral faculty. Were not this the case, it would neither have will nor design, and would experience, without any effect, the impression of the sensitive faculty. By moral faculty I understand that which constitutes the habits of an animal; that which gives a cat a different character from a mouse, and a wolf from a sheep. It is different in every genus of animals, and even in their species; it unites three qualities—instinct, feeling, and action. Instinct consists of the pre-sensations of an animal, or of a previous sentiment of what is suitable for it. By means of it the young, while still in the mother's nest, takes the alarm at a noise, or at the menace of a blow, although they do not know the injury by experience. It is by this previous sensation that they suck the breast, walk, leap, crawl, and call out for relief. They are indebted to it, likewise, for the consciousness of the organs and members of which they make use. Animals are indebted to Instinct, likewise, for a presentiment of their natural wants in other respects. A spider, after coming out of its little egg, does not need to wait till it has seen a model of a web before weaving its transparent workmanship; it is seen at an early age crossing the threads, contracting them to try their strength, and doubling them where it is necessary, having a presentiment that the flies, which it has not yet seen, are destined to be its prey; that they will be caught in the web, and that the struggle may be such as to call for a certain degree of strength in the texture of the materials. Finally, there is no animal without a presentiment of the mode of life and industry which it is destined to exercise, along with the different ideas connected with it."

Mr. LOCKE, in his work on the "*Human Understanding*," remarks that—"I think I may be positive in this, that the power of *abstracting* ideas is not at all in animals; and that the having of general ideas is that which puts a perfect distinction between Man and Brutes, and is an excellency which the faculty of brutes does by no means attain to. For it is evident we observe

no footsteps in them of making use of general signs for universal ideas; from which we have reason to imagine that they have not the faculty of abstracting or making *general ideas*, since they have no use of words, or any other general signs. And therefore I think we may suppose that *it is in this that the Species of Brutes are discriminated from Man;* and it is that proper difference wherein they are wholly separated, and which at last widens to so vast a difference. For if they have any ideas at all, and are not bare machines, as some would have them, we can not deny them to have some Reason. It seems as evident to me that they do, some of them, in certain instances, reason, as that they have sense; but it is only in particular ideas, just as they received them from their senses. They are, the best of them, tied up within those narrow bounds, and have not, as I think, the faculty to enlarge them by any kind of *abstraction.*"

In a late "*Address on Natural Religion,*" by RALPH WALDO EMERSON, as reported in the NEW YORK DAILY TRIBUNE of April 17, 1869, it is said that—"In ignorant ages it was common to vaunt the human superiority by underrating the Instinct of other animals. Better discernment finds that *the only difference is of less and more.* Experiment shows the dog to reason as the hunter does; and all the animals show the same good sense in their humble walk that man, who is their enemy or friend, does; and if it be in *smaller measure*, yet it is not damaged, as his is often, by freak and folly."

The analogies subsisting between Instinct and the human Mind are so strongly marked, and the organization of the brain is so nearly alike in all the higher tribes of animals, that we have only the alternative of regarding Instinct as a distinct Principle, endowed with the lower attributes of the Soul, or the manifestations of the Soul as those of a higher order of Instinct. The latter alternative is the doctrine of the Materialist; for it necessarily results from his assumed premises of the "correlation or equivalence of physical and vital forces," and the consequent application of the doctrine to the "conjoint action of the forces of matter and the materials of the brain as the only source of Thought." (Chapter VI.) The Materialist endeavors to fortify that assumption by comparing the brains of animals of the lower and higher orders, and their brains with man's, and then passes

on to a comparison of the weight of brains of different races of men. The Negro is generally placed at the foot of the scale; though Professor TIEDEMANN, of Heidelberg University, who supposes that man and animals were developed out of "organic matter in a state of maceration in water" (page 176), decides that the brain of the black man is equal in weight to that of the Caucasian, and that the main difference lies in the development of parts in the different lobes. Others have made the same affirmation; while some maintain the contrary. BÜCHNER declares that the brain of the Negro is "much smaller" than that of the white man; and says of Instinct that—

"The intelligence of the animal manifests itself entirely in the same manner as that of man. No essential difference, but only one in degree, can be proved to exist between Instinct and Reason." "The best authorities in Physiology," he says, "are all now pretty much agreed that the *Soul of Animals* does not differ in *quality*, but merely in *quantity*, from that of man. CARL VOGT has recently again discussed and *decided* this question in his own striking manner, so that little that is new can be added." And our Author clinches this assertion by affirming that "Historically, as in Hayti, the Negro presents himself, to use the expression of a writer in the *Allgemeine Zeitung*, half ape, half tiger." And "BURMEISTER," he says, "describes the Brazilian aborigines as animals in their actions, wholly destitute of any intellectual tendencies." "In the wilderness of Borneo and Sumatra and the Polynesian Islands," says Hope, "there are hordes of savages in whom no other mental capacity can be discerned but that low, brutish cunning ascribed to the apes."—BÜCHNER, *on Force and Matter*.

But place these Negroes and savages along with the ape and the tiger, under the same advantages of education—what then? With a similar view to the materialistic doctrine, both as to the Soul and Instinct, it is said by GÖRZ that "the Cuban Negroes are very degraded in character, their moral feeling entirely undeveloped; all their actions proceed from impulse, or a cunning calculation of their own advantages." BURMEISTER says of them: "I have often tried to obtain an insight into the mind of a Negro; but it never was worth the trouble. The only valuable result obtained was, that there is not much mental life in the

Negro, and that all his thoughts and actions are merely directed to the lowest requirements of human existence."

Such are the expedients of *Materialism* in advancing its cause —reckless of the most common rights of humanity. And here it would be interesting, as well as instructive, to contrast with the foregoing degradation of the Negro his claims to an honorable and intellectual manhood as presented by his able advocate, the Abbé GRÉGOIRE, in his work "*De la Litérature des Nègres, ou Recherches sur leurs Facultés Intellectuelles, leurs Qualités Morales*," &c. But our interest at present lies in ascertaining the views which are entertained of the Instinct of animals, and the facts which are brought to show its alliance to the human mind, or to consign it along with the Soul to the domain of matter.

The Negro, however, is not the only argument which Materialism arrays conjointly against the Soul and Instinct. Dr. Büchner seizes upon one half of the human race for the purpose of establishing the doctrine by associating superiority of Mind with the greatest amount of brains, which he alleges are in possession of the male sex. This imputation calls out a Don Quixote (living at Zurich) in behalf of "woman's rights." Her defense is thus repeated by Büchner himself:

"Dr. Schulz-Rodmer," he says, "combats our assertion regarding the greater weight of the male brain in relation to the female with the remark that, being a bachelor, we could know nothing empirically of such a relation. Such remarks may produce stupendous effects among rats and mice."—*Force and Matter, Appendix to 4th edition.*

Our Author, indeed, seems disposed to make little distinction between the best of us and plants. "Man has no right," he says, "to place himself proudly above the *organized* world, and to consider himself as a being of a higher nature."

We have now seen enough of the diversity of opinions upon the nature of Animal Instinct to justify a more specific inquiry into its relations to the Soul, and in what respects they are distinguished from each other, than was presented in Chapter II., under the demonstration of the Soul.

CHAPTER XVI.

DEMONSTRATION OF THE INSTINCTIVE PRINCIPLE, AND ITS DISTINCTION FROM THE SOUL.*

WHATEVER was said as a matter of proof in my demonstration of the substantive existence and self-acting nature of the Soul, in Chapter II., is equally applicable to the Instinctive Principle of animals, although there are many broad distinctions between them. These distinctions involve a critical analysis of the various phenomena of which they are predicated, both in their relations to the Soul and to the mere Principle of Instinct. So much alike, however, are they in their physiological relations to the body that I have incorporated the essential facts and principles in my *Institutes of Medicine*, where they appear in their proper connections with the organic as well as the animal functions, and the influences which they exert upon those functions as exciting and modifying causes; by which, also, a clear demonstration is obtained between the mental and physical attributes, and of the substantive existence and self-acting nature of the Soul and Instinctive Principle. (Pp. 873–911.)

As we have seen (Chapter II.), the Rational and Instinctive Faculties, as commonly accepted, consist of *judgment*, *reflection*, *comparison*, *imagination*, *perception*, *understanding*, *will*, *memory*—the whole, collectively, making up the properties of the Soul, while only the last four belong to the Instinct of animals. Although Mind is generally regarded as synonymous with Reason, I have applied the word indiscriminately to man and animals. The relations of the brain and nerves and of the nervous power

* The distinctions which are made in this work between the Soul and Instinctive Principle, particularly that the latter is simply designed to subserve the uses of organic life, were set forth in the original Edition, which was distributed extensively, and acknowledged in the literary journals, in 1848. The second Edition was published in 1849. This statement is made to protect myself against the imputation of having borrowed from others, who have adopted some of these views, what purports to be original with myself.

or influence to the Soul and Instinctive Principle, their conjoint influences upon the voluntary and involuntary organs, and other relative facts, have been also circumstantially indicated. We have seen, too, that however much some acts of intellection in man may require the co-operation of the brain more than other mental processes, there can be no doubt that every act of Reason and of Instinct is the result of an inscrutable concurrence between the *self-acting* Cause and the organ over which it presides. It may be now said, also, that the brain is subservient to the Soul, independently of its relations to the body, in all its higher functions, while it manifests no such subserviency in animals; nor have I any doubt that all the facts warrant the conclusion that the nervous power is as well concerned in the functions of the higher faculties as it demonstrably is in the acts of the Will and the Passions. The instrumentality of the brain in the former case comes through the property of the Soul which is known as *perception*, and to which the senses are subordinate. The same property belongs, also, to animals; and so far as mere sensation is concerned, or as it may give rise to volition in its simple relation to animal life, the results are apparently the same in man and animals. But it goes no farther in animals, though in man Perception, as resulting from sensation, is the great fulcrum of Reason, and the fountain of intellectual knowledge. But that knowledge garnered up, every avenue to the mind may be shut, and the harvest of facts remains, and may be now multiplied, cultivated, embellished by the exercise of Reason alone upon the organ through which the elementary knowledge had come. It may now summon a host of intellectual images, and render them tributary to those abstruse processes by which the laws of the Universe are scanned, and Mind itself analyzed and understood. This is abundantly manifested in the early displays of genius, where knowledge from external sources is just in its dawn. It is fatal to the doctrine of cerebral images.

There is a mysterious affinity between the Soul of man and the Instinct of animals, which is shown by the corresponding manifestations of perception, of understanding, and of the will in animals; by the amazing precision with which their habits are regulated; by the evidence of common passions; by the coincidence in the external senses of man and animals, through which

they alike acquire a knowledge of external things; by the parallel in the anatomical structure of the brain of man and of animals which stand high in the scale; and by other analogies which denote an affinity between the Soul and Instinct. So great and various, indeed, are the evidences of the foregoing nature, that the special attributes of Instinct are associated with the human mind; thus forming a connecting link, through the moral faculties, between rational and irrational beings.

Nevertheless, the phenomena of the human mind are infinitely superior to those of Instinct, while the operations of Instinct in animals greatly surpass any of its manifestations in man. Many special peculiarities concur, also, in demonstrating an absolute distinction between the rational Mind and Instinct. The latter, for instance, always moves, in each individual species of animal, in a particular, unvarying path, but differently in each species of animal. It never diverges to improve its original endowments, or to add a gain which it did not possess in its infant condition. It is, then, nearly as perfect in its operations as at mature age; nor does one generation of animals gain upon its predecessors. How different with Reason, and with the Instinct of man! He passes through early infancy without a trace of the former, and with only that helpless development of the latter which enables him, with the foreign aid of Reason, to imbibe the sustenance required by organic life. Unlike the Instinct of animals, however, the corresponding manifestations become greatly multiplied as age advances; but it remains always far more circumscribed and imperfect, and often plunging itself, and leading Reason, into violations of their natural functions. And what a contrast between the limitations of Instinct and the progress and grasp of the human mind; the latter forever ranging through all the labyrinths of nature, investigating their phenomena, developing their powers, their subsidiary causes, and their laws; turning in upon itself and multiplying its knowledge, and enlarging its powers by its own independent efforts; laying up the gains of the past as a fruitful source of present good and of farther acquisitions; distinguishing good from evil, from which results the sense of moral responsibility; investigating its own attributes, and attempting even its own nature, and tracing up its existence to a higher Power, as the Author of the Universe which was made for the contemplation and the enjoyment of Mind.

But no such phenomena ever marked the highest cultivation of Instinct. It is all Instinct with animals, while this Principle is only feebly shadowed forth in man. And this leads me to indicate the most fundamental distinction, in a physiological sense, between the Soul of man and the Instinct of animals; nor am I aware of any well-founded exception to the distinction which I make. Among the latter, the whole sum of instinctive processes is *limited exclusively to the wants and the uses of the body.* Whatever may be the fundamental cause, it is in complete operation at the moment of birth, when its dawning has scarcely begun in the human race.* It is as perfect and comprehensive in the Ant as in the Chimpanzee. Each species of animal, and all the individuals respectively, carry out an ordained plan of existence, and this is the compass of their knowledge. From that particular path Instinct never diverges. It has no higher aim in the brute than the mere perpetuity of organic life, and it never operates without manifesting effects, either active or passive, in *the mechanism of animal life.* That is its grand characteristic, and its broadest contradistinction from the mind of man. It terminates there; and Reason, therefore, must prompt the conclusion that the Instinctive Principle perishes with the body. But how different with the Soul, which spans the sciences, rolls up its vast acquisitions through all generations, and sees in itself the "IMAGE of God." All its noblest functions have no relation whatever to the uses of the body. The untutored savage has all the perfection of organic life that is enjoyed by a Newton, and greater instinct. He may become a Newton without a gain to his physical wants, but with some loss of his well-disciplined instinct. Here, in the exercise of Reason, all physiological analogies fail, while every impulse of Instinct demonstrates its subordination to physiological laws. When Reason operates, there is no participation of the nerves, as in the case of Instinct, no influences seen upon

* GALEN relates that—"On dissecting a goat great with young I found an active fœtus, and having detached it, and removing it before it saw its dam, I carried it into a room where there were many vessels, of which some were filled with wine, others with oil, others with honey, others with milk, and others with other fluids; while in others were grains and fruits. The young animal rose upon its feet and began to walk; then it shook itself; and afterwards scratched its side with one of its feet; then it began smelling at all the vessels that were in the room; and when it had smelt them all, it drank up the milk."—*De Locis*, c. 6.

any part of the organism. We look upon its manifestations as emanating apparently from itself alone. And since there is nothing in the manifestations of the Will when it operates alone in the processes of Reason that denotes any influence upon the animal mechanism, as is always the case in animals; and since, also, that influence is strongly displayed in man when the action of the Will refers to the organs of volition, this distinction between its intellectual and physical functions corresponds exactly with my inductions in regard to the general constitution of the Soul, and the relation which it bears in other aspects to the body. Hence we may again conclude incidentally that, by parity of reason as it respects the uses of Instinct, the Soul, which in its highest faculties is useless to the body, will continue to exist without the aid of organic life. And, if I may deviate for a moment from my physiological ground to final causes of a moral nature, I would refer to the manifest design of animals for the human race, as a farther proof of their absolute extinction when those ends are fulfilled; and, on the other hand, to the noble and sublime objects of man in his no less obvious companionship with God, as equally conclusive of the perpetuity of his being.

Nevertheless, the analogies between the Soul and the Principle of Instinct are such that if one be a distinct, substantive, self-acting agent, so must be the other. But their great practical final causes, independently of our other facts, are broad, fundamental distinctions between them; nor have these distinctions, within my knowledge, been hitherto indicated. It is only, however, a display of the common law of analogies which prevails throughout organic nature. The coincidences and distinction between Reason and Instinct are far less remarkable than the corresponding analogies and distinctions which are supplied by organic life in its greatest extremes; for there is not a single organic function of a comprehensive nature performed by man that is not equally so by the lowest plant. With greater reason, therefore, should we argue the identity of Man and Plants than of the Soul and Instinct.

I am finally conducted to other and still more definite contra-distinctions between the Soul and the Instinctive Principle, and where it will probably appear, also, that the brain co-operates less in the higher acts of intellection than has been commonly

supposed. But the Mind, in all its functions, is not only more or less dependent upon its associate organ, but the influences which it is capable of exerting upon it in consequence, and thence upon the whole organism, are among the facts which form a broad distinction between the Soul and the Instinctive Principle. Nor can it be doubted that the full exercise of the Mental Faculties, as well as of Instinct, requires, in a general sense, a natural condition of the brain or its equivalent; and the greatest displays of the former are apt to be seen where the organ is developed beyond the common standard. To these general facts, however, there are important exceptions, several examples of which, as arising from organic disease and injuries, may be seen in my *Medical and Physiological Commentaries*, vol. ii., p. 139, *note*. Equally true is it, also, that, from the co-operation of the Soul and the brain in the processes of Reason, excessive exercise of the Mind is felt injuriously in the organs of organic life, and too often permanently felt. The proper development of the brain is, also, arrested; and thus, in its turn, the Mind suffers a corresponding injury. Our general premises lead to this conclusion, and our primary schools confirm the principle in a lamentable amount of broken constitutions and smothered intellect. This, too, is one of our evidences of the substantive, self-acting nature of the Soul; and although the Instinctive Principle is equally self-acting, we here come upon the remarkable distinction that nothing like the foregoing has ever been witnessed from the severest discipline of Instinct. The Soul alone supplies these phenomena; and, from its incessant operation in undermining health, or disturbing the natural action of the organic viscera, it must be regarded as separating the Soul and Instinct widely from each other.

And this leads us to observe another and greater distinction; for, while the development of the mental faculties is retarded by overtasking the Mind in early life, just the contrary effect obtains in animals. By untiring zeal, and the lash of instruction, Instinct is often susceptible of influences in the *infancy* of animals, and *mostly then;* but here, again, it is just the reverse with Reason in the infancy of man. This distinction is also of a radical nature when compared with the improvements of Reason at later periods of life; for what has been supposed to be a "*culti-*

vation of Instinct" is, in reality, no such thing, since it subserves no useful purpose, and manifests itself only under the special influences, respectively, by which the several impressions were originally produced. The "tricks," &c., of the animal, whenever there is a deviation from the natural operation of Instinct, require suggestions from the associate causes. Unlike the improvements of the Rational Faculty, the artificial conditions of Instinct do not operate without the excitements of the primary causes, or their equivalents, and then always in exact conformity with the nature of the external cause. In other words (for the distinction is important), Reason may act independently of remote causes; the artificial conditions of Instinct require the agency of such causes to bring them into renewed manifestations. In the former case the senses may not be interested; in the latter, impressions must always be made upon sense (as in seeing and hearing), and transmitted to the brain, or some equivalent nervous centre, when Instinct will operate in an impulsive manner. It is only a display of those low analogies between Instinct and the Soul to which I have referred. Imitation, in a higher sense, as seen in parrot-talking, belongs to the same principle. But in these cases it is more constitutional, on account of the natural prating of the bird. It thus becomes ingrafted upon its notes, and will therefore display itself as an offspring of nature, and as a matter of habit, and without any extraneous prompting. What is thus acquired from man by the parrot and magpie, and which has been supposed, even by Mr. Locke, to evince a rational faculty, is derived by other birds from other songsters, particularly by the American mocking-bird and catbird, who appropriate the notes of many other warblers. Now, there is nothing more in parrot-talking than in these last examples, and the latter is just as much an evidence of a rational faculty as the former. The examples go towards the illustration of our subject in showing how Instinct is adapted to the peculiarities of organization in different animals, while man, through his rational faculties, may *originate* an endless variety of vocal music, and construct languages for himself.

Even the promptings of Instinct, which impel animals to search after food, whether for present or future use, have their origin in present sensations. What is prospective in this respect is just as

impulsive as migration, and as little allied to the course of Reason. The same physiological influences of hunger, in regard to immediate wants, operate in the infancy of man, though with none of that discrimination which distinguishes the infant animal; for the human infant will as readily suck at all things else as at the breast. Its apparent instinctive impulses go no farther than the movement of the mouth; and that is *all* the display of instinct it evinces, unless farther shown by its cries when hunger is unappeased.

Again: as soon as Reason obtains its development, it displays an endless variety of inventions for the sustenance of life, which are wholly irrespective of associations with the original physiological incitements, but which must be forever a recurring cause to the animal. Whatever similitude may seem to exist between the acts of Reason and the acts of Instinct in procuring food, or in providing for the future, organic influences are interested in the latter as often as hunger returns; and, so far as the processes are dependent in animals upon the inscrutable constitution of Instinct, they are contradistinguished from all the analogous manifestations in man by their undeviating uniformity in animals, and according, also, to the species of animals, while, also, all the individuals of a species pursue a common and uniform way. Thus many species lie in wait to entrap their food, and although variously according to the nature of the species, all the individuals of a species act exactly in a certain way, while others pursue a different course, and neither takes forecast beyond the present sensation of hunger; while in some species which subsist on vegetable food, the principle operates seemingly after the sagacious manner of Reason in providing for their future wants.

And here we come upon another, and very broad distinction between the Soul and Instinctive Principle; for, as admitted by all, the greater the development of the brain in man, so, in a general sense, are the manifestations of Reason, and therefore a forecast in animals in laying up food, if at all allied to Reason, should predominate in those which have the greatest amount of brain; and here, if in any respect, there should be the greatest display of Reason. But it is just otherwise with all the superior animals, who take no thought for the morrow what they shall eat; while in the bee and ant, where there are only ganglia for the nervous

centres, there is an anticipation of the future in providing for the young which surpasses any thing known of the human race. What variety, too, in the structures which they rear for their progeny, according to the particular species in each genus, but always the same with each species. And then the food—just as methodically of a precise kind as the act of providing it. The whole history of the instinctive acts of the elephant or the dog, which far surpass those of the tribes of apes, may be written in an hour; but Huber found a good-sized book necessary for the amazing operations of the common honey-bee. He described the doings of a hive, and that description tells the precise history of all past and of all future hives. The diversified acts of this insect, and according as it may be queen, male, or drone, seem like the complex movements of some elaborate machinery, which, when wound up, runs on in one precise way till it runs down. And still more estranged from Reason, and utterly beyond its grasp, is the return of the bee to its hive through miles of trackless air, and the unerring flight of the carrier-pigeon; nor are any of the higher animals capable of this amazing achievement, which, also, grows immediately out of the physiological arrangements for acquiring food. And what is remarkably significant of Instinct as distinguished from Reason, and shows that it is designed for the well-being of organic life, and goes to interpret the bee and other animals, is the fact that the *spider* weaves a web *out of its own body* to entrap flies for its food, and builds a dwelling-house within it.* But how vast the disparity between the brains of these animals, and their relative manifestations of Instinct, the bee having only a simple ganglion. Contrary to the prevailing doctrine, we here meet with important anatomical conditions which denote a wide distinction between Reason and Instinct, and which render all our conclusions relative to the dependence of the superior mental endowments of man upon a greater elaboration of the brain than in animals, and a correspondence of the higher and lower grades of Reason with the va-

* It is an old observation that—"There be four things which be little upon the earth, but they are exceedingly wise. The *ants* are a people not strong, yet they prepare their meat in the summer. The *conies* are but a feeble folk, yet make they their houses in the rocks. The *locusts* have no king, yet go they forth all of them by bands. The *spider* taketh hold with her hands, and is in kings' palaces."—*Proverbs.*

rieties in cerebral developments, inapplicable to the Instincts of animals. The greater development of the brain in the ascending series of animals is on account of their more complex organization than in inferior orders, especially the greater development of the senses and the greater uses of the voluntary muscles in the former than the latter. Nevertheless, those animals which possess the greatest cerebral development manifest a greater variety of instinctive phenomena, and their faculties are more susceptible of educational influences than in the inferior orders; but not at all so in the ratio of the proportional development of the instinctive organ. Some species of insects and of birds are capable of a degree of instruction closely approximating the greatest artificial training of Instinct in the superior animals.

Sensation appears to be, either immediately or remotely, a principal cause of the instinctive functions, while the abstract processes of Reason can be traced up, at best, only hypothetically to any connection with the senses. As a general fact, also, Instinct is mostly brought into action by some present sensation when the action relates to the present interests of the individual, such as in relieving hunger, avoiding danger, seeking enjoyments, &c. But there is a forecast of Instinct beyond any such immediate exciting cause among those animals who provide for their future wants; though it is evidently more associated with the sense of hunger than the same care for the future is in man. In the latter instance, indeed, this provident disposition belongs to the same genus of motives as those which prompt all his efforts at some future good; and however much they may have been originally connected with sensation, they never operate in the methodical manner as with Instinct, and are accomplished through an endless variety of intellectual processes.

But there are other phenomena of Instinct that are of more difficult analysis in tracing out the exciting causes; such as the impulse which leads particular tribes of animals to construct their nest and provide extraneous nourishment for their young—especially where both habitation and food refer to a distant future, as in the case of the bee—and the universal parental attachment; though it can not be doubted that sensation is concerned as a moving cause. This is illustrated by the sense of uneasiness which the animal manifests when danger impends its offspring,

or when separated from them. A still more difficult problem is the directing cause which enables animals to return in an undeviating course to their distant home, or to a milder climate; though this, also, depends upon associations connected with present and former sensations—as a sense of hunger, attachment to offspring, or such as arise from vicissitudes of temperature. They have in some degree corresponding analogies in man. But in the latter case all may be the result of contingent circumstances, or a variety of incongruous motives, and of deliberate action. In one case the movements are methodical, and volition operates in obedience to special promptings of sensation. In the other it is untrammelled, and is determined by the reflective powers.

The correspondence between the peculiarities of Instinct and the mechanism in animal and organic life is so remarkably full and perfect in design, and so different from the manifestations of the human mind in their connection with the organs and functions of either division of life, that a glance at the former will contribute farther aid in distinguishing the Soul from the Instinctive Principle, and in proving the absolute existence of Instinct as a distinct essence of the brute creation. If we may anywhere detect the rational faculty among animals, it should be in the phenomena that are relative to their means and modes of subsistence.

Now it will be found that in every species of animals the promptings of Instinct in the pursuit of food have a direct relation to the peculiarities that exist in the organization of the stomach, and the modifications of the special endowments of the digestive fluid in each of the species, by which one is enabled to convert flesh, another nuts, another hay, &c., into one homogeneous substance called chyme, and which, from man to the lowest tribes of warm-blooded animals, at least, is apparently alike in all, whatever the nature and the variety of the food. But the agreement between man and animals is limited to that result in its connection with the digestive apparatus, and as it relates to the maintenance of organic life. What is true of the precise adaptations of Instinct to the organic conditions, and its invariable operation in one way, according to the nature of the animal, is in no way true of the human mind; for the latter operates, in

this respect, according to acts which involve the exercise of judgment, reflection, comparison, &c., and very variously, also, according to individual suggestions of Reason, Passion, love of sensual gratifications, the exigencies of disease, &c.

Since, therefore, Instinct has its special constitution conforming to the organization of the stomach and the peculiarities of the gastric juice, we shall see how far it is related in its peculiarities to other varieties in the mechanism of organic life, by considering how all these varieties in every species, respectively, have an equally direct reference as the peculiarities of Instinct to the special organization of the stomach, and special constitution of the gastric juice. If, therefore, such be the relation of the whole mechanism of animals, both organic and animal, to the special condition of the stomach and gastric juice in their adaptations to the varieties of food in the several species, it is obvious that Instinct in all the species, respectively, must be constituted with a corresponding reference to every part of the organic whole. Now, an intestine, claw, hoof, tooth, or any bone of an unknown animal being given, we may construct a skeleton, say from the bone, that shall be true to nature in all its parts. We may thus proceed to cover it with muscles, provide it with claws or hoofs, and special kinds of teeth, &c., and, lastly, we can tell from that tooth, or claw, or hoof, or other bone, what was the structure of the digestive apparatus, and to what kind of food the gastric juice was specifically adapted, and what were the peculiar instinct and habits of the animal; so special is the adaptation of all other parts of the organism, both in animal and organic life, to the peculiarities of the stomach in every species, and so exactly conformable are the *instincts* and habits of animals to all that vast range of physical peculiarities in the several species respectively.

The foregoing is also true of man as it relates to organization. But who could surmise from any part, or from the whole of his organism, that he is endowed with Rational Faculties, or with any thing more than what is common to brute animals? Here begins, abruptly, a total distinction between man and animals—nothing whatever in the mechanism of either to denote the ending of one or the beginning of the other. Nothing, indeed, but analogy, founded upon observation, enables us to affirm with

certainty the same principles of extinct species of animals. Nothing but observation informs us of either the physical or mental functions; for neither could have been deduced from structure alone. And yet analogy is so perfect a guide where the continuity of the chain is unbroken, that no error can arise in scanning the Designs of Infinite Wisdom, so far as they are submitted to human inquiry. But analogy in relation to Instinct snaps in man. This might render it difficult, if not impossible, to know the great fact, had all the species of quadrumanous animals become extinct before man began his observations in natural history. The subsequent discovery of the skeleton of a chimpanzee would doubtless have been regarded as an unanswerable proof that there had been, at least, other beings upon earth besides the human race who had enjoyed the prerogatives of Reason, and so a descending analogy imagined down to the polypi. But, the chimpanzee is a thousand times less endowed with Instinct than the honey-bee; and we have seen that the sense of instinctive promptings throughout all animal tribes is concerned about objects which Reason regards as only tributary to those immeasurably higher occupations of the Soul which have no relation whatever to those of the Instinctive Principle.

However the foregoing branch of our inquiry may be pursued, it will always result in the same uniform way. Consider, for example, the correspondence between the instincts of animals and their weapons of offense and defense; each species of animals, and all the individuals of a species, acting defensively or offensively according to the special weapons with which they are provided. These means of preservation have a direct reference to organic life, and Instinct, therefore, is adapted to the nature of the means. The various provisions are not only such as are actively employed, both for the purpose of procuring food and for self-preservation, like the weapon of the sword-fish, claws, the poison of serpents, &c., but others for the simple object of self-protection, such as horns, the quills of the porcupine, the armor of the rhinoceros, the sting of bees, the galvanism of the electrical eel, the ink of the cuttle-fish, &c. The same principle is seen in the instantaneous manner in which defenseless animals recognize others of predatory habits. Again, certain animals, and many of them of inferior orders, as some species of

cockroaches, some of worms, and spiders, often affect the appearance of death when closely pursued; and when this is seen in one animal, it is, as in the preceding cases, common to all the individuals of the species. Many other animals that keep near the ground are protected by their color, and the animal, when alarmed, lies close. In all the cases there is a manifest unity of designs which conspire together for the well-being of organic life. Whatever may be the means of defense, of offense, of flight, or of whatever variety or modification, they are adapted to all the mechanism in animal life, to special sensation, &c., and according to the whole will be the special promptings of Instinct.

Fear, therefore, operates in animals impulsively, while in man it is the result of judgment, reflection, comparison, and his modes of defense are suggested accordingly. Observe, also, another fact relative to fear, which equally separates Instinct from the Soul. The young animal will turn from danger about as impulsively as the adult, while the human infant will thrust its hand into the blaze of a candle sooner than it will seize the nourishment that is simultaneously offered. In animals, indeed, the most exquisite sensitiveness to danger prevails, transcending even the promptings of hunger. Its predominance is designed alone for the preservation of organic life, and such are their exposures, and so limited their conceptions, that it is made to operate with great uniformity and instantaneousness. In man, on the contrary, its impulses are comparatively feeble and slow, and so far as it obtains, it aims at a variety of objects which are determined by the decisions of Reason. The principle, in animals, is evidently allied to that characteristic which directs their migrations, and the homeward flight of the bee.

The manifest dependence, in man, of a sense of danger, and his expedients for self-protection, upon the rational faculties, has led to comparisons of certain instinctive perceptions of danger in animals, with a view to the identity of Instinct and Reason, of which one of the strongest is often seen in the elephant on crossing a bridge, or embarking on a steamboat, as he first presses the bridge or the boat with a single foot to learn their stability. But this example is peculiarly adapted to our purpose, since Instinct is here constituted with a reference to the weight of the

animal, who would be otherwise exposed to frequent injuries; and the associations that are indispensable to safety are early formed. But they go no farther, and this particular demonstration is seen only in animals that may break a bridge or sink a boat. It is, therefore, only an instance of the ordinary impulsive associations which are always in operation in cases of danger, and is exactly similar to the careful tread of the smooth-shod horse when about stepping upon ice, or the wariness of the fox and the rat in eluding the trap, or the various expedients of the squirrel in dodging the sportsman, or the cautious nibble of the fish, &c. The varieties in these examples are almost as great as the species of animals, and they all belong to the exquisite intuitive principle which warns them of approaching danger. It is often seen, indeed, in the aspect of mutual protection among animals of the same species, when it always operates according to the nature of the species. The crow has his sentinel, and the affrighted ant communicates its alarm by a peculiar touch of its companion, which spreads with rapidity from one to another, till the whole hive is quickly thrown into this paroxysmal movement. And now, if this analysis be pursued through an obvious series of analogies, it will be found that the habits of bees in relation to their queen, and many other remarkable problems in the history of Instinct, are allied to the principle which I have just considered.

Another shade of difference in the general principle occurs in an example which has been presented by metaphysicians to illustrate the supposed identity of Instinct and Reason. It is that of a dog, who has appeared, when making for a drifting boat, to lay out the plan of first ascending the bank of a stream above the boat, that the distance between himself and the object may compensate for the motion of the water, which would otherwise carry him below his destination. I present the example in its strongest light, and as implying all that can be surmised of a rational process in animals. But, with all instances of a similar nature, it falls within the common laws of the Instinctive Principle, which are just so far operative, according to the species of animal, as shall subserve the exigencies of life. In the case of the dog, this animal is more or less addicted to the water (especially the individual in question), and his instinct is therefore adapted to

the emergencies that may attend that temporary mode of life. He early acquires, in consequence, an impulsive apprehension of the effects of strong currents of water, and is so far capable of forming associations as may be necessary to his safety, or to his natural wants. The instance of the boat is one of safety and of want, and is exactly parallel with that where all dogs will elect a bridge of 500 feet in preference to swimming the width of a dozen. The knowledge of the effects of a current of water exceeds but little that of its quality of wetting; and when, therefore, a dog is moved by the desire of bathing, he neglects the bridge and takes to the water. Various prejudices and misapprehensions relative to supposed instinctive acts abound in the community, who are prone to the most favorable comparison of the brute with his lordly associate. The rarity of apparent evidences of Reason in brutes, and the enjoyment of what is thus unexpected and wonderful, lead the multitude to seize upon what is accidental and carry it to the account of Instinct. An example of this, which has often gone the round of the public, is that of the elephant and the apple, where the tempting morsel, being just beyond the grasping range of the animal's trunk, was made, by a forcible projectile blow, to rebound within its reach from an opposite wall. This has been thought to be but little inferior to a game at billiards. But it was simply an act of irritation, the blow being designed in the same resentment as when an angry man loses all reason and castigates a stone that has caused him an injury.

The following supposed illustration of the endowment of animal instinct with the rational faculties is of more doubtful authority than the preceding; especially as the observation is confined to a single witness. Nevertheless, should it be confirmed by others, and of a flock of crows far short of a "hundred," there will be no question of the possession of reason by crows at least. The story comes from DARWIN (I mean ERASMUS DARWIN), who relates it in his "*Zoonomia.*" Thus—

"On the northern coast of Ireland a friend of mine saw *above a hundred* crows at once preying upon muscles. *Each crow* took a muscle up into the air twenty or forty yards high, and let it fall on the stones, and thus by breaking the shell got possession of the animal. A certain philosopher, I think it was Anaxago-

ras, walking along the sea-shore to gather shells, one of those unlucky birds mistaking his bald head for a stone, dropped a shell-fish upon it, and killed at once a philosopher and an oyster."

But here is an instance, from the same Author, apparently similar to the foregoing, yet widely different from it, as it simply illustrates the educational acquirements of which instinct is capable. "There is," says Dr. Darwin, "at this time an old monkey shown in Exeter Change, London, who, having lost his teeth, when nuts are given him takes a stone in his hand, and cracks them with it one by one, thus using tools to effect his purpose, *like mankind.*"

In connection with these examples Dr. Darwin relates another, which will be readily accepted as within the province of Instinct. "Miss M. E. Jacson," he says, "acquainted me that she witnessed, this autumn (September 1, 1794), an agreeable instance of sagacity in a little bird, which seemed to use the means to obtain an end. The bird repeatedly hopped upon a poppy-stem, and shook the head with its bill till many seeds were scattered; then it settled on the ground and ate the seeds, and again repeated the same management." Such knowledge is readily acquired by Instinct, and as the result of accident. The seed falls when the bird alights upon the plant, and thus the bird acquires a knowledge of the mode of disengaging it; though in most of these instances the animal is making a direct attempt at procuring the seeds as when a squirrel opens the shell of a nut. The example, in other respects, is of the same nature as of the squirrel in detaching nuts from trees, some of which he seizes, but a large proportion escape and fall to the ground, which, like the bird in the case of the seeds, he subsequently appropriates.

Turning now to the doctrine of the equivalence of Mind and the physical forces, we find that the best example which BÜCHNER produces, in his work on "*Force and Matter*," of his alleged proofs of the identity of the human and animal mind relates to the ape.

"At what distance," he says, "stands the Negro from the Ape? The Author saw, in the Zoological Gardens at Antwerp, an ape who had a complete bed in his cage, into which he placed himself at night, *covering himself up like a man.* He performed tricks with hoops and balls, turning all the while towards the spectators

as if he was anxious to show them his arts. He also followed with his finger the shadow which he cast upon the wall."

I have witnessed greater demonstrations of the discipline of Instinct than the foregoing. I have seen a pack of playing-cards upon which were all the letters of the alphabet, and figures from 0 to 9, distributed indiscriminately, "upside down," in a circle of ten feet in diameter, a dog in the centre, and his master seated near the outside of the circumference. I have heard propounded to the dog the combination of the letters into words, and of the figures into certain numbers consisting of five or six units. The dog would promptly start upon the fulfillment of his task. He revolved repeatedly around the circle while selecting the letters or the figures in their proper order, turned the inscribed faces of the cards to the eyes of the spectators, and arranged them, without a mistake, into the required combinations. No "Negro" can accomplish such a feat; neither could our Author. But the dog depended entirely upon the Reason of his master, using only his own Instinct in obeying a certain sign given by the master when he reached the cards necessary to the solution of the problems. The dog's nose swept around nearly in contact with the cards, while, by a gradual turn of the head and body as he revolved in the circle, his eye was constantly directed towards his master, who, as often as the dog arrived at the necessary card, moved a handkerchief in his hands.

And just so was it a matter of instruction in the case of our Author's story of the Ape—the disciplinarian being seated along with the spectators at the Zoological Garden at Antwerp—"the ape turning all the while towards" his teacher. It is, however, a simple affair compared with the foregoing successful plan of the master and his dog to cheat the senses of the spectators at the expense of their reason.

I have been also the witness of a far greater delusion in the case of a supposed *Clairvoyant*, a blind colored woman, at one of the museums in New York. Besides the object of imposing a belief in her endowment with supernatural mental powers, it was intended to demonstrate, at the same time, the minute details of Phrenology by rubbing the "bumps" in a particular direction for the development, in preternatural force, of the imputed faculties, respectively. A friend and myself had been invited by the

manager to witness the performance, and were initiated into the *modus operandi*. The other, but uninformed, spectators, consisted of about sixty gentlemen of scientific and literary pursuits. Several apparently very marvellous revelations were made, which were generally received as the result of omniscience, and as such the event has been incorporated in history. The manager conducted the performance mostly by whispering at a foot or two from exquisitely sensitive ears, while the sound was inaudible to three or four others who were standing upon the stage near to the performers.

Another anecdote may contribute towards dispelling these delusions. I have seen a lion go through with all the details of a dying pig when death is produced by thrusting a knife into the throat. The keeper simply told him to imitate the pig, and then exclaiming, "Now you are stuck!" the lion gave a growl, and began his dying movements, and carried them through in the most perfect manner, reeling in the same increasing way, then falling upon his knees, struggling to rise, and falling again and again, till apparently no longer capable of the effort, and, groaning piteously, he fell upon his side, the struggle still gradually failing, till he rolled upon his back, his jaws widely open, and his whole appearance denoting death. The keeper then exclaimed, "Are you sure you are dead?"—when the lion sprang upon his feet with a tremendous roar. This is also an example in which the acts of the animal were more or less suggested by slight movements of the master, and occasionally a word, though scarcely attracting the attention of the spectators.

The Speculatist points to the care with which animals provide for their young, and the great resemblance between them and man in parental attachments, as an evidence of the supposed identity of Reason and Instinct. But I answer that this is much more seeming than real, and that however the principle may have an ultimate reference to the well-being of organic life in the infancy of man, it embraces in him far loftier objects, and prompts to an endless variety of useful purposes in the care of his progeny which have not the least connection with the exigencies of life, but which, on the contrary, are relative to the culture, the enjoyments, the morality, the religion, the eternal welfare of the spiritual part. It follows them through all the stages

and vicissitudes of life, rejoices in their happiness, and grieves for their adversities. When intercourse fails, every expedient is devised, from the tardy messenger to the electric telegraph, to impart renewed expressions of affection, and fresh hopes of prosperity. And how is it on the part of the offspring? Does not every heart beat responsively to the Divine command to "honor thy father and thy mother?" And can there be a broader distinction between the attachments of animals and of mankind than what Scripture implies and what man pursues? The very attachments which man contracts for favorite animals flow from the Divine sentiment which is impressed upon his Soul. And then all that display of sympathy and friendship among companions of mutual thoughts, or of heartfelt kindness towards the faithful and trusty servant, or the universal characteristic known as the sentiment of humanity—where, I say, shall we look for the dawning of these mental attributes in the constitution of Instinct? And wherein are the instinctive movements of animals towards their offspring related to human affections? Simply for the preservation of life, and thus, incidentally, for the perpetuation of the species, as conclusively shown by the total and abrupt disappearance of brute attachments as soon as the offspring can provide for and protect themselves, and this, too, at ordained times according to the species of animal. Nay, more; parents and offspring mutually abandon each other at allotted times, and turn upon each other. The principle is seen in full operation, and in its largest extent, in the bird while hatching her eggs. She may be in expectation, though she may have had no more experience in the final result than the bee on its return after its first wandering from the hive; nor is there any more similitude with the operations of reason in the one case than the other; she will as readily sit upon counterfeit eggs as her own till her time of "reckoning" is up, and then abandon them.

The same distinction exists between the love of the sexes in the human race and what is observed of the sexual relations in the brute creation, and is not less opposed than our other facts to the assumed identity of Reason and Instinct. Like all else in relation to the latter, the impulse is totally restricted to the perpetuation of organic life. In the human species the same impulse is as a spark in a blaze of fire. The principle of love takes in

its scope the loftiest sentiments of Mind, and anticipates all the intellectual endearments of domestic society, and yields a grateful tribute to its munificent Author. If there be a low analogy, it is of the lowest grade, and is nearly lost in the sublimity of its intellectual accompaniments. Nor can there be a parallel suggested between Reason and Instinct more degrading to man, or more unjust to his Maker, or more characteristic of a perverted mind, than that which is so often drawn in respect to human and brute affections. Yet he who makes it has a better opinion of himself, and only thinks so of the rest of his race.

And this leads me to speak of the very remarkable distinction between the Soul and Instinctive Principle, known as *Conscience.* I employ the term in its popular acceptation, as meaning the ability and the impulse of man to decide on the lawfulness or unlawfulness of his own actions and affections, and to instantly approve or condemn them, according to their nature. Nothing like this has ever been observed in animals. It is purely intellectual, and has a clear reference to the moral, religious, and social condition of the human race. It may be said, however, to be apparent in some animals, as when the dog, for example, manifests a sense of wrong when he surprises the game in a manner opposed to his instruction, or does other analogous acts. But this manifestation happens only under the influence of those physical causes which led him to act more habitually in a different manner. The sense of wrong does not originate from the act, or on account of the act, but is excited by the presence of his master, whom he associates with frowns or the suffering which he endured when his Instinct was undergoing discipline, and thus resolves itself into a dread of punishment. It is, therefore, exactly analogous to all the other functions of Instinct which I have indicated, and forms the limit of associations of which animals are capable.

And what shall be said of that other principle, scarcely less universal and impulsive than conscience—a love of *Fame* and a desire to live in the memory of posterity? The question becomes ridiculous in its application to animals, and is hardly less so, in an abstract sense, as it relates to man. But, as an incentive to laudable action, it is a noble offspring of Reason, and as significant of the Soul's immortality it rises into sublimity.

And what of *Religion?* What of the universal desire of im-

mortality? What of a sense of dependence upon a Superior Being? It may be safely affirmed that animals have no other knowledge of their own existence than what arises from present sensations; and should a chimpanzee be seen bowing even to an idol, it would be a greater phenomenon than the expostulation of Balaam's ass.

Even *Memory*, as it belongs to animals, is nothing but an association awakened by some present impression upon the senses. It is brought into operation by any impression coming through the senses, as from a glance at an object, or perhaps only some momentary sound, with which a habit, or only some former action, or some want, or a pleasurable sensation, is associated; or, from internal sources, as hunger, thirst, &c. If there be an apparent display of reflection, as in a series of consecutive acts without any immediate relationship, they appear to be suggested by the sensations as they arise in a consecutive series, and to depend much upon education. Indeed, Memory is so indispensable to many of the wants and habits of animals, it is pronounced so strongly in many species that they will recognize objects after a separation for long intervals of time, particularly where strong impressions had been made, as between the dog and his master, and wild beasts and their former keepers. In man, on the contrary, memory is often relative alone to acquirements which the mind has made through its own processes of reflection, and they may be as vast and profound as the elaborate inductions which led to the discovery of the universal law of gravitation, and thence to the calculation of the existence of the planet Neptune. Nor does memory, in man, require any extraneous aid, like the apparently corresponding function in animals. It is a rational function in one, independent of sense; an instinctive one in the other, and dependent upon sense. In one, it always involves an exercise of Reason, and often a vast complexity of ideas; in the other, it is simply relative to the single impression which had been transmitted to the brain by some external cause, and which can be recalled only by renewed applications of the same or analogous causes. By extending the analysis in this manner, it will be seen that it is all Soul in man, and all Instinct in animals.

But the most curious problem in the history of Instinct is its natural mutations in certain animals, and which carry with them

an abundant proof of the radical distinctions between that principle and the Soul, and that the former is designed for the mere purposes of organic life. I shall, therefore, give to the subject a greater consideration than would be otherwise expedient.

This characteristic is seen especially in animals that are subject to metamorphosis, though in many of the instances the changes of organization and the modifications of Instinct are far greater than in others. The strongest examples occur in insects, a large proportion of which have four stages of existence: the egg, the larva, the pupa, and the imago, with corresponding instinctive habits in the last three. Where the metamorphoses are most remarkable, as in the foregoing examples, some of the organs undergo mutations that require a change in the stimuli of life which could not be realized without corresponding adaptations of Instinct. This is also more conspicuously illustrated by the difference in the wants and habits of those animals which at one period breathe in the water with gills, or analogous organs, and subsequently in the air with lungs.

Now these metamorphoses are as much the exact result of determinate laws, ingrafted upon an original constitution of life, as the development of the human ovum, or the seed of a plant; nor are they in any respect more fluctuating or less circumscribed; and so a corresponding law obtains in respect to Instinct, through which the promptings of Instinct shall harmonize with those modifications of organic life that distinguish the several stages of metamorphosis. In all the cases, from the plant to the insect, and from the insect to man, the metamorphoses or other developments and modifications of life, take place in one uniform way, according to the species of animal or plant. A potential whole, embracing all the special conditions necessary to the progressive changes from the ovum, through the larva and pupa to the fly, and in all analogous instances, is as perfect in the most mutable tribes as in the ova of the highest order of animals, or in the seeds of plants; and, since there can be no departure from a precise and uniform succession of developments in any of the species respectively, we also learn that there is no transmutation of species, nor even an introduction of varieties. (See Chap. VII.)

In respect to the various physical agents required by animals subject to metamorphosis, according to their several stages, the

principle is alike ingrafted upon the ovum, and equally so in the case of man, by which his development is started by one kind of vital stimulus, and is farther conducted through fœtal life by another kind, while a variety obtain after independent life begins. It is a metamorphosis in all. (Chapter VII.)

This brings us to the particular application of our subject, the simple subserviency of Instinct to the exigencies of organic life. Here it is, in the well-marked metamorphic animals, that it is distinctly seen that all its modifications keep pace, *pari passu*, with the changes of organization, aud that the law is exactly coincident with that which respects the changes of structure, and is designed alone to fulfill the necessities of the latter. They equally spring from a common principle of mutation implanted in the germ.

There remains to be considered the comparative independence of the Soul in the exercise of its highest functions; when, also, certain anatomical facts between man and animals will be reviewed for the purpose of contrasting them in yet other relations to the Soul and Instinct.

Although there be a co-operation of the brain with the Soul in all acts of intellection, it does not follow from what has been said that the Rational may not act in greater independence of the organ than the Instinctive faculty. Just otherwise, indeed; for my argument to this effect is founded, in part, upon the distinctions which I have indicated between the Soul and Instinct, and upon what I am about to say of the general coincidence between the brain of man and of the highest orders of animals, though an opposite conclusion has been deduced from this relation. But the inference as to the equal dependence of the operations of the Soul and Instinct upon a concurrent action of the brain or its equivalent has also depended upon a neglect of the distinction in their attributes, or an assumption that there is no difference. The analogy in such a case would be sound and conclusive, so far as it respects man and the approximate animals. But our premises are indisputable, that all the higher acts of intellection, every thing which falls within the province of Reason, have no existence in animals. It is the only thing, indeed, which essentially distinguishes man from the brute, and would be in itself conclusive against the prevailing doctrine that man was once a

member of the quadrumanous race. We have also seen that Instinct is more comprehensive in certain respects in many insects where a ganglion takes the place of a brain, and far more allied in its operations to the plans of Reason, than in the highest order of animals, and is often as mature in the new-born as in the adult being; and since, also, the organization of the brain of the higher animals is greatly like that of man, but without any of his intellectual functions, we must logically conclude that what is so absolutely peculiar to the Soul, and, as generally granted, allied to God himself, acts in greater independence of the brain than does simple Instinct. But so inscrutable are its connections, as well as those of Instinct, with the organ in which it resides, that I shall not trespass beyond the limits which are prescribed by observation. Our facts terminate abruptly at this point, and mystery begins. But we may pursue the facts, and reason upon them as upon the most tangible evidence. We will therefore interrogate other proof in support of our conclusions.

We have seen that every variety of cerebral structure, from its approximation to man's in the higher animals, to its disappearance in a scarcely appreciable ganglion in the lower tribes, is attended throughout with undeviating and perfect manifestations of Instinct, though according to the nature of the animal, while they are only dimly seen in the human species. This, in respect to Instinct, is conformable with all analogy as it regards other organs where the results depend upon anatomical structure acting through the principle of Organic Life. There is every variety, for example, in the organization of the liver, from its greatest elaboration in man and the higher animals until we meet with it in the lower orders as a bundle of tubes or a simple sac. Yet in all it generates a product which is nearly the same, and which performs the same office throughout. And so of the kidneys, salivary glands, stomach, &c.

So far the analogy is complete between Instinct and its organ, and the Principle of Life and all parts of the body which that principle animates. But Instinct, as we have seen, must not, therefore, be confounded with organic products. The analogy, indeed, goes with our other facts in showing that it is the *cause* of certain results through the instrumentality of the brain, or its equivalent, and the nervous system, as the Principle of Life is

the *cause* of other results in and through that same system of organs and every other variety of structure.

Coming to the brain of man, the foregoing analogy totally fails as it respects the manifestations of Reason and Instinct. There is an endless variety of the former, but scarcely a real exhibition of the latter. We see all in the structure of the fully developed animal brain that can be detected in the human, or with only the modifications that are incident to approximate species, but a perfect blank as it respects the rational faculties. The analogy, however, is complete in man's, so far as the brain subserves all that Instinct can discharge among the animal tribes, and all that is relative to the latter in the contributions which the nervous system makes to organic life. The only difference here is the substitution of the Intellectual for the Instinctive functions; and whatever relates to the manifestations of Instinct, and all the influence of the passions upon the organs of organic life, are demonstrative of the co-operation of the brain with the Soul. But the moment we leave this ground and approach the abstract operations of the higher faculties of the Soul, there is not the slightest indication that the brain has any functional connection with the processes, however much its integrity may be necessary; and the only foundation for the conclusion that such connection exists is the analogy which is supplied by Reason in its exercise of the voluntary and other Instinctive functions of animals.

Again: we have seen that in the infancy of man the Mind is inoperative, while the Instinctive Principle of animals is nearly as active and comprehensive in their earliest as in their latest stage of existence. We have also seen that Instinct is susceptible of artificial impressions, resembling education, in the infancy of animals, and mostly then. This distinction can proceed only from a radical difference between the Soul and Instinct; and the attendant final causes of that difference consist in the special design of the Soul for rational functions when the body is sufficiently mature for any practical purposes, and of Instinct for the simple uses of the body. The necessity of Instinct, it may be farther said, is superseded in man not only by the endowments of Reason when it comes into individual operation, but by its delegated offices before its development takes place, while no

such protective care, as a general fact, can be extended by the Instinctive Principle to the new-born animal. Hence, therefore, as there are no superfluities in Nature, Instinct is in full operation at the birth of animals, when there is no display of it in the human race, nor is the Soul only slowly developed in its rational faculties. And thus do the physiological facts, the manifestations of Reason and of Instinct, and the final causes concur together.

And now comes up the remarkable anatomical fact, which goes also to the same conclusions (although supposed to be in opposition to them), that Instinctive acts are irrespective of the progressive stages of cerebral development, while those of the human mind await that development. This corresponds, in respect to animals, exactly with what we know of the general maturity of the functions of all other parts at all stages of life, and with what we have seen of the objects of Instinct and Reason, since the former must be in early operation for the exigencies of organic life, while the Soul, in the complexity of its functions, and according to its objects, is only ready to act when the brain shall have acquired sufficient maturity for those endless physical impressions which come through the medium of the senses, and from which the Soul gathers its earliest treasures of knowledge.

Such, then, is the relative aspect in which must be regarded the correspondence between the progressive development and maturity of the brain and the operations of Mind in early life; the development or maturity of the brain having as well a reference to the multifarious physical contributions from the senses, as to their appropriation by the Soul; while, also, the admirable Design obtains of rendering the brain complete in all its relations to the organs of organic life from the moment of birth, and, on the other hand, its endowment for the uses of the Soul exactly progressive with those physical developments of other parts that are indispensable to the objects of Reason at the different stages of advancing life. The design is inexpressibly sublime in its numerous yet distinct involutions, as they relate to organic and animal life and the uses of Reason. The Soul, therefore, may be, abstractly considered, in as perfect a state in infancy as at any stage of life.

Thus it appears that, besides the physical development of the

brain which is requisite for the impression of natural objects, that maturity of the organ is, also, as a part of the design, a necessary medium through which the Soul may appropriate the impressions. Having made these advances, the Soul comes to act in more or less independence of sensation, and to multiply knowledge by its own efforts. Nevertheless, it is peculiarly useful to my purposes that instances are seen of occasional displays of Reason in early childhood which are surpassed at adult age only by genius of the highest order. In some of these rare cases there had been only the most slender antecedent relative knowledge acquired through the medium of the senses, but the Soul itself originated its own vast conceptions, carried them into a variety of practical applications without the instrumentality of foreign aid, and to an extent where erudition, with all the appliances of sense and the facilities of instruction, falls far short of equal achievements—as witnessed in the institution of mathematical principles and processes. And here we strengthen our position by the converse rule, since in none of the cases has there been a ratio in the advances of Mind corresponding with the advancing maturity of the brain, while in some the early intellectual ability has settled down at adult age to a common mediocrity. In the latter case it can not be doubted that the progress of the brain has embarrassed the rational faculties. Again, there is every gradation in Reason, from the Hottentot to the highest order of genius. There are no two individuals alike either in its compass or in the manner of its exercise. How different is all this with Instinct, which directs every individual of every species of animal in one uniform way, and no one of them enjoys, throughout all generations, any different or greater endowment than all the rest.

And thus do the contrasts between the Soul and Instinctive Principle correspond with the anatomical contrasts, both as they relate to the brain of man and of animals, and to the human brain and other organs in the state of infancy, and with the coincidences in function, instinctive and organic, between the brain of animals or its equivalent and other organs at all stages of life. And here, too, should be brought into review what has been said of the injuries which are inflicted upon the Mind and its associate organ, and through those influences upon the whole organism, by overtasking the Mind in early life, while no such injuries are

sustained, but the contrary realized, by a severe exercise of Instinct in the infancy of animals.

It may be now well to inquire into what is meant by *ideas*, and whether there be generally any definite conception of their nature, and, by ascertaining the facts, endeavor to show by this method that the earliest acquirements through the instrumentality of the senses demonstrate the self-acting and originating endowment of Mind, and that it is distinguished, at its very dawning, from the Instinctive Principle, by the characteristic of forming ideas of the *nature* of objects. This inquiry, like the rest, belongs alone to the Physiologist. How, then, does sensation give rise to what are recognized as *ideas* by Reason? The impressions transmitted to the brain through the organs of sense, or such as may arise from internal causes, do not, certainly, constitute the *ideas*, as is apt to be supposed; and, according to my demonstration, the impressions made upon the brain can not, through any physical or chemical influences upon the organ, elicit the ideas from the organ itself. The impressions must, therefore, of necessity, call into action a Principle or Agent by which the ideas are alone formed; from which it appears that the process by which the Mind seizes and appropriates impressions transmitted through the organs of sense, is similar to that by which it multiplies and originates ideas. It is true, animals have the capacity of forming ideas so far as they depend upon the promptings of sensation, and upon impulsive associations with the past that may be awakened by renewed sensations of a more simple nature. But they stop there. They are merely ideas of sensation; while, on the other hand, the results of sensation in man terminate in intellectual images which have no analogies in the brute creation, and these are the essential final cause of the human Soul. It is the Soul, therefore, which mainly does the work in acts of intellection, while, in respect to the simple ideas of sensation, external objects, or internal causes, like that of hunger, supply the materials. This is enough for my purposes; and it will be as vain to inquire into the *modus operandi* of the Mind in its abstract operations, or in its perception of external objects, or how impressions are made upon the nerves of sense, or what their nature, or how they are transmitted by the nerves to the brain, or how they call the Mind or Instinct into action, as to interrogate the *modus operandi* of Creative Energy.

Such are the conclusions to which the evidence of anatomical and physiological facts have successively led; nor have I any doubt that others will see in the demonstrations that man is an animal only in his physical being; that in Mind he is far less allied to the things of the earth than he is to their Author; and will realize a corroboration of their own conceptions, that the Soul and Instinctive Principle are so far differently constituted as implied by the ultimate existence of one in an abstract condition, while the other shares the destiny of organic life. They will see, I say, a new ground of belief in the immortality of the Soul, and in the perishable nature of Instinct. And if this be so, they will see in my premises and conclusions a contradistinction between God and Nature, and what is equivalent to a demonstration of the existence of a Creative Spirit, in which alone the Thinking part of man can have had its origin. And, coming to other details in relation to man, they will realize in the Mosaic declaration that "the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life, and *man became a living Soul*," an Inspiration from Him who "created man in his own image," and repose with equal confidence in the assurance that, although "the dust shall return to the earth as it was, *the Spirit shall return unto the God who gave it.*" They will abide in the emphatic distinctions between the dust, the breath, and the Soul, and regard the Spirit as a special gift, a new Creation, and the body as referring to materials already in being, and which were designed in their organic state, and kindled into life, to connect the Spiritual part with the material world; and they will also see in the limitation of the statement as to the Soul of man what is the ultimate destiny of Instinct.

Hence it follows, if Revelation be received as to the *immortality* of the Soul and the *death* of Instinct, it must be received, also, as revealing a fundamental distinction between them, and should operate as a perfect barrier with all those who uphold the Scriptures against the common prejudice of identifying Instinct and Reason, as confounding the revealed distinction, and therefore promoting infidelity in its aim at materialism and annihilation.

Again: such is the nature of our premises, that, if the Soul of man be *immaterial*, so is the Instinct of animals. There are, moreover, no violent transitions in nature. The material existences,

especially the organic, pass gradually, as it were, into each other. And so, it can not be doubted, it is with the immaterial, from brute to man, from man to angels, from angels to God.

> "Of systems possible, if 'tis confessed
> That Wisdom Infinite must form the best,
> Where all must fall or not coherent be,
> And all that rises, rise in due degree;
> Then, in the scale of *reasoning life*, 'tis plain,
> There must be somewhere such a rank as man;
> And all the question (wrangle e'er so long)
> Is only this: if God has placed him wrong?"

But we have also seen from our premises that, as soon as Instinct shall have fulfilled its objects, it perishes with the life of the animal; since, especially, all its present uses are limited to the wants of the body. Nor will its extinction affect the analogy of which we predicate its *immateriality*, nor contradict in the least the *immortality* of the Soul. We deduce the latter, apart from Revelation, not from the Soul's *immateriality*, but from some of the facts which contradistinguish it from Instinct, that all its higher faculties have no relation to the uses of the body, and from the analogy which subsists between them and the Attributes of the Creator. We infer, also, the *immateriality* of the Soul, in part, from the same analogy; though it is essential to this analogy that it be conceded that the Omniscient, Omnipresent, and Omnipotent Being is as different from the inert matter of which He is the Author as their manifestations are different from each other. And again, if these premises be admitted, it follows that *immateriality*, or something totally distinct from matter, is indispensable to the unlimited duration of the Almighty, and therefore that it must be rendered equally so to the Soul. But the acknowledgment of a Creator carries with it a full admission of His immateriality, otherwise matter would be self-existent, and God and the Universe would be on common ground. The latter is replete with Design, and that is the most that could be affirmed of the former. Neither should depend for its existence upon the other; nor, as we have seen, can matter create matter. I say, therefore, again, that *Materialism* is *pantheism—atheism.*

It need not be repeated that the *immateriality* of Instinct is inferred from its feeble analogies to the Soul, though not in the

least to any manifestations of those attributes which ally the Soul to its Maker.

It will have been seen that *materialism*, in its proper acceptation, and the question as to the *materiality* of the Soul, are distinct from each other, since the former denies the existence of the Soul as a substantive agent, while the latter admits it. My object has been to substantiate the *existence*, more than the *immateriality* of the Soul. But the proof of the latter has constantly attended all that I have shown of the *self-acting* nature both of the Soul and Instinctive Principle, which contradistinguishes them from every known attribute of matter. The nearest approximation, in the light of analogy, to what may be material, is to be seen in the Principle of Organic Life; and here the resemblance consists in action alone.* But the Principle of Life requires the operation of numerous physical causes to bring and maintain it in sensible action. It is impossible, therefore, to adduce a single phenomenon of the Soul or of Instinct that bears a resemblance to the manifestations of matter.

Our inquiry may be variously pursued, especially upon the great basis of analogy. It is one of no little moment at the present day, and materialism must abide its own facts and method of reasoning; a ground, however, which nothing can shake when presented according to its ordination in nature. In the present case, the admitted facts are co-extensive with all animal existences, and they are bound together in the different races by close resemblances. Indeed, in each of the series the facts differ only by shades. The evidence here is of the strongest possible nature, not only on account of the universality of the facts, but because they are founded in the unchanging character of organic beings.

Resting, therefore, in the conclusions which I have now expressed, and anxious for their greater prevalence against a progressive and already widespread materialism, I have been led into this discussion in the hope that it may remove some of the

* The eminent Professor Müller, who, in his work on *Physiology*, mingles Chemistry very largely with his doctrines of Life, goes so far as to say that "*There is nothing in the facts of natural science against the possibility of the* Vital Principle *being immaterial, and of its independence of matter, though its powers be manifested in organic bodies or in matter.*"

obscurities of the subject, and also advance the great truths in Physiology and Medicine. The province of the Physiologist extends beyond the mere physical relations of matter and Mind. Of those relations he is the only expounder. But it devolves upon him, also, to seek in the depths of Physiology for the constitution of Mind as distinguished from matter; and thus, also, contribute towards a right faith in a future state of being. Wherever, indeed, he turns his inquiries into organic nature, he sees in the mechanism of every part—individually and collectively as a harmonious whole—in every function and product, separately and relatively—in the properties by which they are carried on, and in the laws by which they are governed, the most perfect evidences of consummate Design. It is the duty of the Physiologist to turn all this immense weight of proof against those crude doctrines of materialism, mental and medical, which have had their origin either in the closet of the speculatist or in the laboratory of the Organic Chemist. And thus, also, shall he secure from Mankind that homage for Medicine which is due to "the Divine Art," and again restore the Hippocratic axiom that "a philosophical physician is like a god."

As it respects the Soul and Instinctive Principle, we have now seen that they are *substantive* existences, and all organic beings are made up of the common elements of matter. But there is no element known in the inorganic kingdom which affords any of the manifestations which characterize the Soul and Instinct, or any of the results of the organic mechanism. The latter, therefore, was endowed with new properties when the elements were brought into organic union. To say that vital properties were "slumbering in the elements" is a frivolous assumption, and necessarily involves the conclusion (which has been probably intended) that the Soul, also, is equally inherent in the elements, which is the worst kind of materialism. But the manifestations of the Soul and Instinct are, as we have seen, not only totally different from those of every organic process, but can not be generated by the material part. These principles, therefore, were as much created as the elements of matter, and, as they exist in union with the organized structure of man and animals, it is inferable that the structure was created simultaneously, and by a common act, with the spiritual part. Or, if the material ele-

ments were first combined, it would equally follow that it was a direct Creative Act, since the Soul and Instinctive Principle must have been created for the distinct purpose of being associated with the material body. The rule, of course, applies, through the analogies of structure, to the vegetable kingdom, which it is equally consistent to suppose was created in the form of plants as of seeds, or as that man and mammiferous animals were created in a state of maturity, according to my demonstration in Chapter VII.

APPENDIX I.

THE CREATION AND ORGANIZATION OF THE EARTH.

"The growth of *new systems out of old ones*, without the intervention of Divine Power, seems to me apparently absurd." "It became Him who created all material things *to set them in order;* and if He did so, it is unphilosophical to ask for any other origin of this world, or to *pretend that it might rise out of chaos by the* MERE LAWS OF NATURE; though, being once formed, it may continue by those laws."—NEWTON, *Optics*, Book III.

IN my work on Theoretical Geology (1856) I have given a critical attention to the Creation of the Earth, as deduced from geological facts and the established principles of the physical sciences; and it is now my purpose to present that demonstration in this Appendix, and thus render it instrumental in establishing the Divine origin and proper interpretation of the Mosaic Narrative. We here enter, therefore, upon substantial geological ground, and I shall carry along those fundamental laws which are profoundly involved in the creative acts that are exclusively relative to the earth; but of a different character from that philosophy by which I have endeavored to demonstrate the literal meaning of the Narrative of Creation, and that the Narrative was as precisely dictated as were the Ten Commandments. (Chapter XIV.) And although I do not here intend to employ the Word of God in proof of itself, yet as our discussion continues to be predicated of His statements, we must necessarily have them before us. I shall proceed, therefore, in the first place, to state a few of the Creator's declarations upon the subject of Creation, which will sufficiently cover the whole ground of the first Chapter of Genesis.

"*And the earth was without form and void; and* DARKNESS *was upon the face of the deep; and the Spirit of God* MOVED *upon the face of the* WATERS.

"*And God said,* LET *there be* LIGHT; *and there was light.*"

"*And God said,* LET *there be a* FIRMAMENT IN THE MIDST OF

THE WATERS; *and* LET *it* DIVIDE THE WATERS FROM THE WATERS;" that is, רקיע, firmament, to *stamp down*, and מבדיל, to *separate* or *divide*. "*And God made the firmament, and divided the waters, and* IT WAS SO."

"*And God said*, LET *the* WATERS *under the heaven be gathered together unto one place, and* LET *the dry land appear. And* IT WAS SO. *And* GOD CALLED *the dry land Earth, and the gathering together of the* WATERS *called He* SEAS; *and God saw that it was good.*"

"*And God said*, LET *Us* make man in *Our Image, after Our Likeness.*" "*And God created man in His own Image.*" "*The Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul.*"

I have introduced the foregoing series of creative acts for the purpose, also, of showing, by the coincidence of language in which they are expressed, that a common rule of interpretation must apply to the whole; and that same rule must apply equally to every other part of the Record, as demonstrated in Chapter XIV. By no possible prevarication can this fundamental law of language be violated or modified; and least of all where every consecutive act is equally a part of a systematic whole. This principle is as true of the plans of man as of the Creator. If the declarations, therefore, in respect to the creation of *light* and of *man* denote, as the exigencies enforce, the direct exercise of Creative Energy, then, by the analogies of the acts, as well as by the sameness of language, the organization of the earth was dependent upon that Energy.

Our premises declare that, when the earth was brought into being, it was in a chaotic state. But whether this be admitted or not (as it universally is), I shall endeavor to demonstrate that by no possible operation of the properties and laws of matter could the earth have been brought into its present condition without the direct interposition of "the Spirit of God"—so forcibly and Divinely expressed by the words, "*The Spirit of God* MOVED *upon the face of the* WATERS." Nevertheless, it will be seen that the necessities for Creative Power in the organization of the earth, and in the production of atmospheric air, were less than in bringing the component materials into existence, or in the creation of living beings out of the materials; and my dem-

onstration of this will be founded throughout, as it has been in respect to organic beings, upon those "natural laws" which Theoretical Geology so much adores. (Chapters VII. and VIII.) The foregoing distinction grows out of the absolute differences between the properties and laws, and organized conditions, of inanimate and animated beings; though in the application of the term *organization* to the earth it is used in a generic sense, and simply relates to that crystalline structure of the primary rocks which distinguishes them so broadly from their amorphous conditions, or as transformed by heat into trap and basalt, without confounding their composition or structure with those of organic beings. That composition, and the relative positions of the crystals, imply as distinctly the direct interposition of Creative Power as do the relative positions and composition of the several parts which make up the living being. There can be no sounder maxim in philosophy than that which obliges us to refer to a Higher Power what the laws of nature are clearly and absolutely incapable of explaining; and especially where all the important facts are directly opposed to the laws of Nature. Moreover, in those crystalline rocks which compose the great bulk of the earth, we shall find the evidences of Wisdom and Unity of Design of which human reason would be a humble imitator. Our reason, I say, prompts the conclusion that, after the direct act of creating the earth in a chaotic state, it would either leave the materials to organize themselves into granite and other crystalline rocks, and into organic beings, according to the philosophy of Theoretical Geology, or, should this be totally impossible according to the admitted laws of Nature (Chapter VII.), Reason would avail itself of those laws and the properties impressed upon matter, and exert its creative power in co-operation with them, and effect such a result as would be most in conformity with their natural operation, so far as the projected plan would admit. Such, exactly, is the case before us, Creative Power having done nothing more than what would have been done by human reason. And all this is not only taught by Revelation, but it is important to the dignity of "the Science." The organization of the earth was far less exclusively an act of Creative Energy than any of Christ's miracles; for in the former case, as we shall see, the properties and laws of matter were called into definite action,

while the miracles had no such relationship, but were purely creative acts; and if either is to be determined by its probabilities, or by any weight of testimony, who will not sooner yield to the irresistible proof which is forever before his senses and understanding?

Very different, however, from the organization of the earth is the case of living beings. Here the properties of life having no existence in the elements of matter, there could have been no co-operation with them as in the organization of the earth, but, of necessity, there was as much a creation of these properties as there had been of the materials, and therefore equally so of the Soul and Instinctive Principle. (Chapter VII.) Nor was it left to Theoretical Geology to predicate its analogical speculations, in these important matters, of the constitution of the globe, but it was forewarned that—"The Lord God formed man of the *dust of the ground*, and breathed into his nostrils the breath of LIFE, and man became a LIVING SOUL."

The Sacred Writings abound with examples both of the co-operation of Creative Power with second causes, or with instrumentalities which are equivalent to such causes, and of many miraculous events which are purely of a creative nature, in which natural processes are apparently imitated. But here the argument addresses itself to those who admit the general truth of Revelation. Of one or the other of the foregoing natures was the whole of God's administration during the Theocracy: the conceptions of our Lord and of John the Baptist, in the former of whom were united the prerogatives of Creative Power with the peculiarities of a dependent second cause; the Magi conducted by the miraculous star; the frogs coming out of the water upon the land of Egypt, where they must have been created, as well as the miraculous hail, then and afterwards; the plague of locusts; the turning of dust into lice; the quails and manna; the preparation of Jonah's fish and gourd; the fall of the wall of Jericho; the subjugation of the Heathen nations; the circumstances attending the Deluge and Ark; the conversion of water into wine, and the loaves and fishes of our Lord, &c., &c. The language, also, in such of the foregoing instances as were wholly miraculous or entirely of a creative nature, generally corresponds with the apparent imitation of natural processes. This is the pre-

vailing manner of presenting such acts throughout the Bible, and begins at the very outset of Creation; as in the expressions—"Let the waters bring forth abundantly," &c.—"Let the earth bring forth the living creature," &c. This is so characteristic of Revelation, and so admirably harmonious with the relations of things, that it forms an internal proof of its Divine origin; and this inference is farther confirmed by the fact that the precaution is generally taken as representing the events as the results of Creative Energy—as that, "*God created* great whales, and every living creature," &c.—"And *God made* the beast of the earth," &c. —"And *God made* every plant of the field *before it was in the earth*, and every herb of the field *before it grew, for*," &c.

The profession of "science," and of the "laws of nature," rendered it an easy achievement to ingulf all classes of society in either the Neptunian or Plutonic theory of the formation of the earth. Even the unflinching advocate of the natural interpretation of the Mosaic Narrative has often failed to perceive that the admission of either doctrine is in palpable contradiction of himself, since either necessarily involves "the long indefinite period" of Theoretical Geology, and its application to an interpretation of the stratified rocks, and the "medals" which the fossiliferous embrace. The man of faith, rather than be regarded as deficient in "science," has been thus taken in an inextricable snare, since if either the Plutonic or Neptunian theory be true, all that is said of the agency of the Creator in the organization of the earth would be the merest fiction. But more than all, the man of faith has been allured into a belief in the chance-doctrine, that the Creator so endowed the elements of matter and the laws of inorganic nature with creative forces that they could carry out, of themselves, all the wonderful plans of Omniscience, and that this view of the subject, so utterly contradicted by all that is known of second causes, actually redounds more to the glory of the Creator than the supposition that he was directly instrumental in the completion of his own works. (See Chapters VII. and VIII.) Nevertheless, in respect to the foregoing hypotheses, there are unequivocal indications in the primary rocks of their having been in a state of solution in water; and, as will be shown, they also abound with proof that they have never been evolved from a fused or nebular condition.

According to the Word of God, the earth, immediately following its creation, was in a blended condition of water and other mineral substances; and, from the remarkable expression—"*The Spirit* of God moved upon the face of the waters"—we are enabled to infer, so far as this authority may be admitted, that the solid material was intimately incorporated with the water. This derives farther confirmation, also, from the statement that "*God said, Let the waters under the heavens be gathered together unto one place, and let the dry land appear: and it was so.*" But we have conclusive testimony of all this yet in prospect; and I will now say that, since the inspired penman could not have deduced his conclusion of a chaotic state of the earth, and its subsequent organization, from any geological knowledge, and therefore, if directed by his own reason, he would have represented the earth as created in a perfect state, like man, animals, and plants; and since, also, it may be shown to be in the highest degree probable that the earth was brought into being in the very condition set forth in the Narrative, an important internal proof is thus supplied of the Divine authenticity of the statement. Such, however, I say, would not have been the statement of an uninspired writer, who, at the same time, pronounced the demonstrable realities of the creation of man and animals in a state of maturity, and carried out the principle of Unity of Design in respect to the organic kingdom, and of the exigencies of animals in regard to food according to the duration of the Creative Days, by affirming the creation of "every plant of the field *before it was in the earth*, and every herb of the field *before it grew*." (See Chapters VII. and XIV.)

It may be also insisted at the outset, that the universally accepted Plutonic, or the so-called Nebular Theory, is as absolutely opposed, not only to the whole Mosaic account of Creation, but to all the facts supplied by the earth, as fire and water are opposed to each other. However it may be assumed that there was "a long indefinite period between the beginning and the first of the Six Days," it will not help the hypothesis. But the details of the Narrative commence with the first day, and it was on that day and the two following days that the *chaotic* condition and organization of the earth are described. Earth and water are represented as having been at the beginning in an universal-

ly commingled state; and this is to become a subject of proof by those living witnesses, the primary rocks. The subsequent parts of the Narrative determine the fact, also, that the writer was describing the condition of the earth in its nascent state, and its first evolution from chaos. It is an integral and consistent part of a common whole; and if there be any truth, therefore, in the statements relative to the creation of plants, animals, and man, then must the account of the primary condition and organization of the earth be regarded as descriptive of the first acts of Creative Power. There is no other method of evading this conclusion than that of Laplace in his ambitious reply to Napoleon.

From the various premises, therefore, which have now been stated, we may proceed, before coming to the proof, to infer the probability that the solid portions of the earth were created in a state of concentrated solution, the most insoluble as well as the most soluble—all in a state of inextricable intermixture excepting by that Power who brought them into this condition, but far less confounded, and far more perfected, than their elements would have been according to the nebular hypothesis. It is considered, as we shall see, by some of the most enlightened Chemists, that the solid contents of the earth embrace the necessary solvents; and if it be thought that the present quantity of water was insufficient, we may consistently suppose that an ample provision was made, for it will be shown to have been essentially a matter of Creative Power, though much of the process involved the simultaneous operation of second causes. Admitting, however, for the present, that this is only conjectural, we are entitled to say that it is far more probable than what we shall see of the remarkable violations of the laws of nature, and even of possibilities, which surround the hypotheses of igneous fusion, or a nebular condition. How the metallic substances and some other things were brought into a state of solution, it is not for me to explain, except as it may be readily deduced from the display of Creative Energy in the organization of the primary rocks.

Among the facts which render a concentrated solution of the solid materials of the earth in the highest degree plausible are the vast depositions of silex from an aqueous solution in various parts of the globe; and a very exact analogy occurs in what is sometimes seen on breaking open siliceous geodes, when the wa-

ter within them immediately deposits crystals of the same mineral. Chemistry, in expounding the common phenomenon of incrustations of geodes, remarks that, "Some unknown condition must be supposed in order to explain the existence of siliceous crystals in closed cavities, *which never could have contained water enough for the solution of the materials, unless they were originally in a much more soluble state.*" Immense crystals of this mineral, and sometimes embracing masses of gold, have been also the admitted result of an aqueous solution under very analogous circumstances, and precisely such, too, as form a principal component part of granitic rocks. And yet, vain would be the attempt of man to effect the slightest solution of silex or quartz, in their ordinary state, by water alone; and least of all the other component parts of granite, mica and feldspar. If, also, either of these crystals be subjected to the action of fire, it is completely destructive of their crystalline condition, and Chemistry would as soon undertake the conversion of iron into gold as the formation of any granitic crystal by the agency of caloric. But Chemistry, through one of its enlightened Professors, and an advocate of the long geological periods, and of the igneous origin of the earth, supplies all that can be desired in support of our interpretation of the primary condition of the earth. It gives us an ample amount of solvents, while no small proportion of the water was incorporated in the crystalline rocks when "the dry land appeared." Thus our Author—

"*We are compelled to admit* that in the early periods of the earth the ocean must have prevailed far more extensively than now, if not universally; or, in other words, *the existing dry land must have been under water.*" "Now, *what properties* may we fairly suppose would have belonged to the *waters* that hovered over the embryo islands and continents still immersed in their *native* element [after Pluto had done his part], before the elevation commenced by which the dry land was made to appear, and what qualities may we not suppose the present ocean to possess at profound depths, where its pressure is great, and in those places where the heat may also be active and long prevailing. Water, under such circumstances, must evidently be a fluid of very peculiar properties. It must contain all the chemical agents not only that are soluble in it, but also that are soluble in a com-

pound fluid consisting of water and of other agents still more active. The acids would be solvents for the alkalies, the metallic oxides, and most of the earths; the alkalies would be solvents for alumina and silica; acids and alkalies may have alternately prevailed; and even if acids, alkalies, and earths, and the other metallic oxides, had been present at the same time, and had formed salts, these compounds, so far as they were soluble in water, would also impart to the fluid peculiar solvent powers; while those compounds which were precipitated would be thus removed, so as not to impede other agencies," &c. "It is worthy of remark that quartz, feldspar, and mica, the prevailing minerals in granite, gneiss, and mica slate, are composed mainly of silica and alumina. Now, silica and alumina are very soluble in the fixed alkalies; alumina is soluble in acids, silica in hydrochloric acid, and this agent can render silica gaseous. There are notable quantities of potassa and soda in both feldspar and mica, and fluoric acid has been found in the latter. It appears, therefore, that *those solvents were present at the birth of these minerals*, and entered into their constitution. Alkali exists in the earth in vast abundance, and thus even silica and alumina may have been provided with an appropriate solvent. The *solubility of all the existing materials* that form the crust of the globe; their solubility in all their elementary forms, or in their prismatic or complex combinations, *is a matter clearly demonstrable, and actually demonstrated.*" Moreover, our able authority contributes the following statement to our creative or Mosaic theory, and which is intended to represent the condition of the earth in its supposed transition-state from Pluto to Neptune. "The deepest rock," he says, "of which we have any knowledge is not of a *mechanical deposit.* It is made up principally of crystals, or of parts more or less crystalline in structure, *mutually adjusted by salient and rectangular angles.* Every thing implies a previous state of corpuscular mobility, the particles having liberty of motion; and the only powers equal to the effect are heat and electricity, aided by water and the saline, alkaline, acid, and other soluble chemical agents." — Professor SILLIMAN'S *Appendix to Bakewell's Geology.*

We are thus supplied with all the necessary data, founded on the strictest scientific principles, for our demonstration. I proceed, therefore, to say that the crystalline structure alone of

those rocks which form the great bulk of the earth is not only demonstrative of their condensation from a solution in water, but that by no possibility could the different crystals have obtained their relations to each other without the direct agency of Creative Power. Granite is composed of three small crystals in juxtaposition, each one of which is of very different solubility, or fusibility, and therefore condensible at very different states of solution or of fusion; and yet their relative positions declare their simultaneous formation. And what but the directing agency of Creative Power could have arranged those three crystals side by side of each other throughout all the granite of the globe? Were it possible for the crystals to have emerged from a state of solution or of fusion without such agency, the three kinds would have formed at very different times, and would have either mingled in indiscriminate confusion, or each would have consolidated into masses of quartz, feldspar, and mica, remote from each other. Here we meet, at the onset, with a condition of things which proves a simultaneous and sudden condensation of the solid materials of the earth, and in exact correspondence with the Scripture account both as to the Divine agency and the time employed. But this, as we have seen, does not in the least imply that "the Spirit of God," when it "moved upon the face of the waters," did not *co-operate with the properties* already impressed upon matter, in bringing the globe into its finished condition; while, also, such would be the inference from the ways of the Creator, and from the structure of the crystals. It is, also, unimportant as to the questions of fusion or solution, excepting as Revelation and all the facts contradict the former supposition and proclaim the latter. Indeed, as will be shown, the Plutonic or nebular hypothesis is condemned by all that is known in science.

I now come to another direct and absolutely imperative fact, and in exact correspondence with the Divine Narrative. This important fact consists in the vast amount of water which is incorporated in all the crystalline structure of the rocks, and which not only proves their original solution in water, but, as we shall see, is alone subversive of the Plutonic, or igneous, or nebular hypothesis; for each of these terms expresses essentially the same thing. This insuperable fact in demonstrating the aqueous

solution of the rocks might be extensively illustrated and enforced; but no farther assistance is required for the enlightenment of those who may be disposed to abide by the logic of facts; although this water of crystallization will be farther applied in proving the absurdity of the nebular hypothesis.

Reserving for a subsequent stage of our inquiry a more elaborate examination of the positive evidences which the earth contains of the direct interposition of Creative Power in its organization, I shall first adduce others which are less demonstrative in an absolute sense, but which are not less conclusive in their relations to such as are demonstrable.

What, then, should have been the consequences of a sudden reduction of the globe from an aqueous condition into "dry land and seas," upon the principle that second causes were in full operation so far as was consistent with the exigencies of the event, and with that general superintendence of the Creator which all but the infidel allow? Certainly, an universal generation of vapors and gases throughout the entire mass, and as certainly an eruption of mountain-ranges in all quarters of the globe, both in sea and on land; and as the mountains were thrown up, the corresponding formation of valleys simultaneously provided for the seas. Indeed, it is abundantly manifest that such must have been the origin of the seas; and there is ample proof that the mountains were at first submerged, and that the great ranges were of contemporaneous appearance.* All was natural, save only that organizing influence which Pantheism recognizes only in the laws of nature.

Such, therefore, is not only in exact correspondence with the present condition of the globe, and with what is implied by the Inspired Narrative, but there is no other theory which will in the least explain the phenomena; while, also, there is ample proof that the subalpine, and even minor elevations, followed in quick succession, notwithstanding, as we shall see, the supposed contradictory phenomena of the fossiliferous rocks. A great development of latent heat would have been another consequence of the sudden condensation of the solid parts of the earth, resulting in

* The division of "the waters which were under the firmament from the waters which were above the firmament," has been considered in Chapter XIV., along with the general internal proof of the literal meaning of the Narrative.

the early fusion of a large extent of those rocks which had been thus consolidated, and which will abundantly explain the numerous extinct volcanoes, and the dikes of trap which have been so embarrassing to Theoretical Geology, especially as they occur in the coal formations, or where they are apparently obtruded into the stratified rocks, but not rising above their surface; in either of which cases, as will be shown in Appendix III., the coal, or the mineral strata, have been simply deposited around and upon these ancient igneous eruptions.

The rarity of animal exuviæ upon the summits of lofty mountains is one of the proofs of their early elevation; and their abundance in the lower hills is no evidence of a long subsequent interval, since the prolific nature of the animals would render a century or two sufficiently ample for the exigencies of the earliest fossiliferous strata. Who, it may be also suggested, shall presume to limit the "abundance" in which aquatic animals, as the Narrative informs us, were originally created? But, as our proof must rest upon ascertained facts, it is only necessary to refer to the rapid multiplication of fishes, and of the testaceous tribes; nor is it any longer doubtful that coral reefs are of speedy formation. But immediately after the consolidation of the primary rocks the waters were highly charged with calcareous and other substances more soluble than mica, silex, feldspar, &c., and hence the rapid deposition of the limestone rocks, while the abundance of the testacea involves the necessity of their predominance in those oceanic deposits.* All objections, indeed, are fast disappearing that can interfere with a supposed occurrence of a sudden, early, and simultaneous upheaval of the great mountain-ranges and the subalpine cliffs; and their universality proves

* Bakewell, in his Geology, enters into a calculation upon this subject, taking the bodies of fossil fish in the chalk formations as a test of the rapidity with which the depositions took place—"Their entire and uncompressed bodies," he says, "prove that the chalk which surrounded them was *extremely soft and yielding*, as also with the argillaceous strata." (See Appendix III.) "Several days might elapse before the body was completely buried under calcareous earth. If, say seven days, and estimate the thickness of the fish at three inches, we shall have a chronometer to measure the time required to form a stratum of chalk three inches in depth, namely, one week. This is equal to one foot in a month, or twelve feet in a year; and could we suppose the deposition to proceed without interruption, it would not require more than *ninety years* to form a mass of chalk-beds *one thousand feet in thickness*, which is more than all the chalk-beds in England."

the sudden organization of the globe, for by no other process could the necessary vapors and gases have been so suddenly and universally generated as the facts in the case demand. Nor can there be any other interpretation of the quick subsidence of those violent causes, and of their continued absence, except as they were pent up for a longer time in certain localities, as not improbably where the upheavals occurred which were instrumental in "breaking up the fountains of the great deep" at the time of the Noachian Flood. While, therefore, it would be necessary to concede that an absence of the mountain-ranges would be demonstrative of the hypothesis of the slow formation of the earth, their presence is conclusive against it. As to the eruption of mountains and hills through sedimentary strata, such may have occurred soon after the organization of the earth, since, as will have been shown, its stratification was immediately consequent; or, it is highly probable that more or less of the elevated regions that have been obtruded through the sedimentary rocks were thrown up on the event of the General Deluge. And thus, as we shall ever find it throughout our vast field of inquiry, the Creator has impressed upon His works the most conclusive evidences of the literal meaning of His Word. To the foregoing agencies should be added those which have occasioned the later and limited upheavals, and which have been due to volcanic action consequent on local decompositions and other chemical actions beneath the upraised localities, and which are still in progress.

Although, therefore, it be always our purpose to move on in concert with philosophy and Revelation, if we were to take the latter alone for our guide in the case before us, we should equally attain the certainty of a sudden organization of the earth on the third day of Creation as the direct result of the "*Spirit of God moving upon the face of the waters*," and, as specifically stated in the command—"*Let the waters under the heaven be gathered together unto one place, and let the dry land appear;*" since it would be necessarily inferred that such an organization or sudden condensation of the earth as is thus declared would have been attended by a generation of vapors and gases which would have speedily resulted in a general upheaval of mountain-ranges.

We have already seen, by a variety of demonstrations, that

the relationship of the earth, water, atmospheric air, light, &c., to living beings proves that the latter were created with special adaptations to the former in all the minutest details (Chapters VII., VIII., and XIV.); and I shall now proceed to apply the same philosophy in proof that the inorganic department was equally created with a special reference to all the details of organic life, and that they were alike brought into being by direct acts of Creative Power. Of the earth, however, in this relation, but little need be said, since its adaptation to living beings, and to no other conceivable object, is manifest to all, and therefore distinctly implies, in its incalculable compass and unity of designs, an exercise of that Creative Power which man ascribes to himself, in an imitative sense, whenever he adapts one thing to the uses of another. Some of the grandest evidences of Design, however, in the earth's relation to living beings are less obvious than others; such, for example, as the precise inclination of its axis, any deviation from which would embarrass the conveniences of organic life, as would also any change in the periodical revolution of the earth upon its axis; the exact density of the earth, by which it is critically adapted, in respect to gravitation, to all the different species of animals and plants, and by which, also, through an *established solidity*, the days and years are maintained of an unvarying length; the precise adaptation of the earth to all organic beings in respect to light and heat, by an exact adjustment of its distance from the Sun; the exact adaptations of the different earths, even of the primary rocks, in their elementary constituents and combinations, to the wants of the vegetable kingdom, and thus, indirectly, to the subsistence of the animal; all of which, individually as well as collectively, proclaims the direct agency of an Omniscient Creative Power in adapting precisely the various physical means to the constitution of every plant and animal; and equally, also, in so organizing every plant and animal upon one uniform, universal plan that it should harmonize throughout with all the details relative to light, heat, gravitation, air, water, &c. (Chapters VII., VIII., and XIV.)

With the exception of air and water, the foregoing considerations rarely enter into our contemplation of the designs that are relative to animals and plants, while each one of them is as sig-

nificant of a direct reference to living beings as atmospheric air and water, or that the vegetable kingdom was specifically designed for the subsistence of the animal. Could finite reason, therefore, bring into one comprehensive grasp all the evidences of design in the immense variety of the physical adaptations of the globe to organic beings and in connection with the evidences of design as displayed in every part of the organic fabric, the concentrated effect of such a display of Design would supersede the necessity of demonstrating, by the constitution of the primary rocks, their immediate dependence upon Creative Energy.

And now, a word more as to atmospheric air and water, whose labyrinth of designs is known only to the diligent student of organic nature and of the physical sciences. I shall, however, only glance at them in their vast relations to all living beings, both plants and animals, to whose existence they are so indispensable that they are about as much *a part* of the Design of every living being as any immediate parts of the beings themselves. Indeed, it may be with as much propriety affirmed that the respiratory organs, and the whole assimilating apparatus, do not enter into the design of animals and plants, and maintained that these parts were organized and adapted fortuitously to air and water (as we have seen to be no uncommon doctrine among scientific men), as to assume that these physical agents of life were accidentally produced for the variety of indispensable wants of all living beings. These exigencies are as true of one as of the other; and, were there only one of the physical agents, water only, the clear deductions from that one alone should confound the advocates of spontaneity of being, whether it respect its immediate necessity to animals and plants, or its uses in adapting the earth, in multifarious aspects, to the farther necessities of its living tenants. But when to that *one* atmospheric air is added, and of the same universal importance, and when it is considered how exactly suited it is to the many thousand modifications of organs of respiration in animals and plants, and the former yielding their carbon in consequence, and the latter consuming the carbon through their respiratory process; and considering, also, how the atmosphere subserves the peculiar exigencies of the feathered race, and how it unites with water to subserve, through the medium of that fluid, the respiration of aquatic animals, and farther, also, that the

elements of air and water form three of the four principal elements of the whole organic kingdom, it becomes too manifest for any elaborate proof, that no fertility of imagination can devise the sophistry which will expound the elaboration of either water or atmospheric air from a chaotic state of the earth by the properties impressed upon matter, and carry with it the overwhelming weight of those organic designs which attest the direct superintendence of Infinite Wisdom. (See Chapter VII.)

Whoever, therefore, rejects the immediate origin of either air or water in Creative Power must necessarily maintain the absurd doctrine of the spontaneity of living beings, both animals and plants. But if the latter be allowed to have depended upon Creative Power it follows, from the demonstration, that the physical agents must be equally referred to the same Causation. These premises being obtained, proof of the same nature may be readily multiplied in an increasing ratio, such as the exigencies of light, &c., and thus by every superadded law the force of the demonstration will be increased to a manifold extent. But we are now interested only in carrying the same philosophy to the earth in an aggregate sense; which is done not only upon the ground of analogy as it respects its simply physical constitution, but especially as the earth is exactly suited, in its physical condition, and astronomically, to carry out all the designs and final causes of living beings. Nay, more: the earth is so constituted as to be exactly suited to an immediate connection with the whole life of plants through the medium of their roots, while the foliage finds in atmospheric air and light equally universal and indispensable means of sustenance. And thus the demonstration shows that the earth is as much a part of the design of plants as are atmospheric air, and water, and light—the whole being in this respect on a par; while, also, from the absolute dependence of animals upon the vegetable kingdom, the constitution of the earth in its present exact condition is indispensable to the life of the entire animal kingdom. The universal adaptations of the earth, therefore, in so many critical conditions, to all living beings preclude the possibility of its having been organized without the direct exercise of Creative Power; and, according to our demonstration as to atmospheric air and water, a denial of the same Creative Agency in relation to the earth necessarily implies, as in the

other cases, a belief in the spontaneity of plants and animals, which I have shown to be a physical impossibility (Chapter VII.).

By the same unanswerable reasoning, it is equally certain that the earth, atmosphere, water, general average temperature, and light, independently of their vast and indispensable relations to organic beings of a direct nature, were originally ordained by a fiat of the Almighty, so as to give rise, through their mutual and harmonious concurrence, to many of the physical conditions, such as rain, ammonia, carbonic acid gas, &c., upon which organic life is farther dependent; and therefore, from the exact identity of organization and life in the most ancient as most recent beings, as denoted by all the fossil "medals," the whole must have been originally produced as it now exists. The proof of this might, indeed, be allowed to rest upon *light* alone (as now propagated by the sun), in its present relation to animals, and as indispensable to the vegetable kingdom, upon which the animal depends. The former, in a direct sense, have, for example, the same visual organs now as at first, to testify to the exactness of our statements, and to the discomfiture of the doctrine of "extinctions;" while the organization of plants, in all its fundamental attributes, remains without change, and therefore the same exact light as now was indispensable to their organization at their first appearance upon earth.

Connected with this demonstration should be, also, the absolute impossibility of explaining the existence of oxygen and nitrogen gases in their atmospheric relations, and oxygen and hydrogen gases as constituting water, upon the Plutonic or nebular hypothesis, or by any other theory than that of Creative Power. That oxygen and nitrogen gases should have gone off from a fiery intermixture of some sixty other elements to form atmospheric air, and oxygen and hydrogen gases should have extricated themselves to form water, and without regarding the evidences of design in their universal relations to plants and animals, is not to be entertained, excepting by those who imagine that the sixteen or seventeen elements of which all plants and animals are composed disengaged themselves from the same blended assemblage. (See Chapter VII.) And here it should be duly considered that the nebular or Plutonic doctrine necessarily supposes something more than a simple state of *fusion*. It

supposes the existence of all things in the form of the simple elements of matter, and in chaotic intermixture. This is shown by the permanently *gaseous* state of oxygen, hydrogen, and nitrogen, in their uncombined conditions, and by the numerous elements which go to the formation of mica, feldspar, &c. Nor should we lose sight of the special fact that the oxygen and nitrogen of the atmosphere do not exist in chemical union, but as a simple intermixture. And here it should be observed that the nebular hypothesis supposes that the elements went off from the jumble of more than sixty through their elective affinities, and thus united into special chemical compounds, while no such elective attraction occurred between the component elements of the atmosphere; although they readily unite chemically in the formation of nitric acid and nitrous oxide. This single example, therefore, must be carried to all other elements, whatever may be their affinities for each other, and some other theory must interpret their chemical combinations as they exist in the crystalline rocks. This consideration should also be carried to what I have said of the hypothesis which assigns the origin of plants and animals to the emersion and coalescence of their sixteen or seventeen elements through their inherent properties. (Chapter VII.) Farther, as it respects atmospheric air, the peculiar adaptation of its elements in their mixed condition increases a thousand-fold the absurdity of their supposed departure from their gaseous associates; and, in being thus adapted in a very special manner to the exigencies of plants and animals, both as it respects *respiration*, and, as shown by Dulong, the refraction of *light* (being different in the latter respect from what would be the case were these elements chemically united), it greatly increases the objections to the hypothesis of a fortuitous emersion of the elements, as does, also, the *definite proportions* in which they exist, as indispensable to every plant and animal. But suppose such an obvious absurdity possible; there would then remain the greater one of assuming that all living beings came into existence under the influence of this fortuitous atmosphere, as well as of water and light also, by the united agency of which all the beings were brought continuously into exact vital adaptations to those physical agents respectively.

Nor may I neglect saying, in this fundamental view of our sub-

ject, that other things of less importance in the economy of life, but which contribute a very delicate test, must be assumed to have been elaborated by the *atmosphere*, since their harmonious relationships could not otherwise have happened; such as organizing the vocal apparatus of man, beasts, and birds, so as to impart to the atmosphere those endless undulating movements which give rise to all the phenomena of speech, voice, song, &c.; and it must have been equally tributary to the wonderful mechanism of the ear, in all its varieties as they exist upon land, while *water* must have taken the same part in adjusting the organ in aquatic animals to their element. These agents, one or the other, in the cases respectively, must have also contributed towards methodizing that conductor of sensation, the auditory nerve, nor have ceased till they had suitably arranged the central part, or brain, which receives the transmitted impressions, and the Mind, by which the impressions are discerned. And so of *light* in respect to the eye, &c. Such a concurrence of circumstances could be the only mode of originating living beings if their origin depended upon "creative laws of nature;" while, also, as admitted by the Duke of Argyll and others, the supposition is necessarily involved that these laws or forces, and other agencies of inorganic nature acting under them, are endowed with *will* and *intelligence* (pp. 235, 245). Nay, more: the precise density of the earth, its exact distance from the sun, &c., must have been also, as I have shown, harmonious concurring causes in developing all the designs that exist in the organization and functions of every animal and plant—all of which is precisely what is meant by the "creative laws of nature," the "parturitive powers of the earth," "spontaneity of living beings," Darwinism, Spencerism, &c. If, however, on the other hand, it be admitted that organic beings were created in a direct manner, it must be equally conceded that the same consistent Intelligence was as directly instrumental in bringing the earth, air, water, &c., into their present condition, since they form an indispensable part in the plan of Design in relation to living beings.

Again, I may repeat, for what other conceivable purpose was *nitrogen gas* brought into being than for the important uses of animals and plants, both as an extensive element in their composition, especially of animals (accomplished through a wonderful

process carried on by the joint action of plants and many harmonious external agencies), and scarcely less necessary to the respiratory function of the whole department of the two living kingdoms? None whatever. Moreover, it is the disposition of nitrogen gas to fly off from all compounds, and to break them up, excepting the living being; and there could be no gunpowder without this peculiarity. It is also a principal cause of the rapid decomposition of animals as soon as death takes place; and upon this extraordinary fact I have founded a fundamental distinction between the living and dead compounds of animals, and thus proving the existence of a vital principle in total opposition to the forces of inorganic nature. (In works on the *Philosophy of Vitality and Modus Operandi of Remedial Agents*, 1842; and in *Institutes of Medicine*, pp. 34–36.) And again: what other use can be assigned for *hydrogen gas* than to constitute another of the principal elements of animals and plants, and serve, also, as the base of water. None whatever. Where else, or to what extent, do we meet either with *nitrogen* or *hydrogen* gases, than in atmospheric air, or water, or living beings? Nowhere; in any sense at all relative to our subject.

The manifest Design in all the concurring facts now stated, each one having a clear reference to all the rest, and to nothing else, stamps all the hypotheses of chance or second causes as blind attempts in opposition not only to certain specific facts, and the most obvious evidences of Design, and to Revelation, but to the clearest demonstrations which can be afforded by the forces and laws that are impressed upon the whole inorganic kingdom, and, therefore, as nothing but "science falsely so called." Now, to turn all these proofs of the direct agency of an Omnipotent, Intelligent Being (and therefore the great proofs of the existence of such a Being), against His manifest agency in consummating His own Works, is precisely equivalent, in principle, to the sophistry of the Pharisees, that Christ "*did not cast out devils but through Beelzebub, the chief of devils.*" But, as remains to be yet farther seen, the most astonishing consideration attending the whole physical *rationale*, which excludes the direct agency of Creative Power as it respects the organization of the earth, is the total disregard of the ordinary operation of physical forces, which would have necessarily resulted in an inexpressible chaos of mineral

compounds. This disregard of fundamental facts and laws would be the more astonishing, were it not that many enlightened Physiologists of the present day attribute the origin of the whole organic kingdom to the fortuitous coalescence of sixteen or seventeen elements of which each individual is composed.

Perhaps I should now rest this inquiry; having, as it appears to me, expounded the Revelation of God to man in its only possible meaning. I am not inclined, however, to leave any remaining important ground unoccupied. But before proceeding to other direct proof of the necessity of Creative Energy in the organization of the earth, we must have the nebular hypothesis of its formation before us. It presents the condition of the earth before it was detached, as supposed, from the sun, and professes to resolve the problem of its reduction from a chaotic state of its elements into an elaborate organization, fitted for the uses of man, animals, and plants; and that it is instrumental in providing the materials for the coal-formations. All that is essential to our purposes in the igneous hypothesis may, therefore, be quickly told. But its examination will be more extended; when it will be seen that all the facts are not only fatal to the hypothesis, but confirm what the constitution of the earth and all its vital relations proclaim as to the direct agency of Creative Power in evolving it from its condition of chaos. It will be seen, also, that, notwithstanding the instrumentality of the properties of matter in reducing the earth from its aqueous solution, some of the objections about to be alleged against the nebular hypothesis apply equally to the old Neptunian.

The Plutonic or nebular hypothesis of Theoretical Geology assumes that the earth was originally a component part of the sun, and existed in a gaseous condition of an inconceivably exalted temperature, in which all the elements (more than sixty) were in chaotic mixture, and that as they cooled down the elements separated themselves into distinct groups, to unite into the various exact crystalline compounds which make up the primary rocks.*

* It is undoubtedly remarkable that the spectroscope gives plausibility to the opinion that the sun and earth, and the stars also, are more or less alike in composition. But this would only correspond with the analogies in composition that prevail among all the inhabitants of our globe; all of which, too, were made out of the earth. The supposed coincidence, therefore, between the composition of the sun and earth no more proves the evolution of the latter from the sun than the coincidence in compo-

A part of them went off, in the requisite number and proportions, to form the complex granite; another group departed to organize the hornblendes; others to syenite; and others to make up the rarer crystalline structures; while others went alone, individually, or along with oxygen gas, such as gold, silver, platinum, iron, copper, lead, tin, zinc, arsenic, &c., and their ores; and the hypothesis supposes that the process of cooling, and all the foregoing aggregations of the elements into the crystalline compounds with their water of crystallization, began while the earth was still attached as a rim to the circumference of the blazing sun. But the advocates of the origin of living beings in the spontaneous coalescence of the elements of matter begin with the earth in its finished state, with only two of the sixteen or seventeen elements of which animals and plants are composed in a distinct gaseous form, and all the others either solid or united into chemical compounds. (See Chapter VII.)

And all that we have now seen is called "*Science.*" Let us, then, invoke Science still farther to our aid in demonstrating the perversion to which it has been subjected. If "the Creator endowed the elements of matter with properties that enabled them to enter into union so as to result in the evolution of the earth," as we have seen, also, to be affirmed of animals and plants, "Science" will not assume that there was any special endowment for that particular purpose, but will allow that they possess the same qualifications now as at the day of their creation. But the most simple experiments with chemical affinities assure us of the certainty that such a crude mixture of elementary substances, when undergoing condensation, would have resulted in an indistinguishable mass of rubbish. It has been said, however, with much exultation, that a few crystals of *feldspar* have been found on the walls of a furnace.* But how they got there; whether by acci-

sition between man and plants proves that the human race sprang immediately from a mushroom.

* This celebrated discovery is noticed in the following manner by the Rev. Dr. Buckland, in his *Bridgewater Treatise on Geology:*

"Professor Kersten has found distinctly-formed crystals of prismatic feldspar on the walls of a furnace in which copper slate and copper ores had been melted. This discovery is *very important, in a geological point of view*, from its bearing on the theory of the *origin* of crystalline rocks, in which feldspar is usually so large an ingredient. Hitherto *every attempt to make feldspar crystals by artificial means has failed.*"

dent, design, or by the *decomposing* and *recombining* power of the furnace, or whether they were genuine crystals of feldspar, remains a question. The water of crystallization, however, is proportionally small in this mineral, though less so in some of its varieties. Let it be considered, also, that feldspar is composed of six elements, silicon, aluminium, potassium, calcium, iron, oxygen, and of very various fusibilities; and its universality and abundance in granite and syenite must assure every unprejudiced mind that there is about as great a chemical improbability that the several elements of feldspar should have gone off from more than fifty others to form the most extensive mineral compound of the globe, and in a crystalline state, as that the sixteen or seventeen elements of plants and animals should have emerged from their mineral combinations after the solidification of the earth, and have organized themselves into the various animal and vegetable tribes. It is, however, through the doctrine of the origin of living beings in the elements, in virtue of their inherent properties, that we come to understand how the cosmographers carry the same assumption to the scarcely less unique organization of the crystalline rocks, and where the sophistry is far less easily exposed. But it is as true of feldspar as it is of organic compounds, that if the Chemist had in his hands all the elements of which it is composed, and in their exact proportions, his attempt to unite them into that crystal would result in a confused mixture of many compounds.

If, therefore, the nebular hypothesis be thus manifestly contradicted by a single component part of granite, the objection is increased in a prodigious ratio by the same obstacles which are presented by *mica*, another crystalline constituent of granite. This crystal is composed of not less than ten elements, having six that belong to feldspar, though in other proportions, and four of which that crystal is destitute, viz., lithium, manganese, magnesium, and fluorine. Some variations occur in different specimens; but it may be stated, in a sufficiently universal sense, that the same elements, and in about the same proportions, make up the composition of this crystal. Now it is not doubted that, by no process whatever can the chemist reunite these constituents into a decompounded scale of mica of any appreciable weight; nor, as in the case of feldspar, can he bring any analo-

gies from the existing operation of natural causes. The same affirmations may be made of *hornblende*, which is substituted wholly, or in part only, for mica in granitic syenite, but along with the other constituents of granite, and which is composed of nine elements. It is also worth saying that, according to the demonstrations which will have been made, it is in vain to assume that syenite has been universally in a state of fusion because it is found occupying, as it is said, unexpected positions, as in overlying clay-slate. Under these circumstances it has been thrown up, and in such a state of fusion, arising from local chemical actions, as to overspread the slate; and in all such cases it will be found that the crystalline structure of the primitive rock has been effaced by the heat. An example of this kind occurs in the extensive trap-region on the western shore of the Hudson River, where the primitive granitic rock, which is readily fusible in a grate of anthracite coal, is occasionally found adherent to the molten trap and basalt; and it supplies also an example in which *mica* is present along with *hornblende* —thus greatly complicating the problem relative to the organization of the primary rocks by the presence of four constituent crystals. Nor may I neglect this occasion to remark, that it will be seen that such examples which have been produced in behalf of the nebular hypothesis are in total contradiction to it. Pluto has here and there taken possession of what was originally deposited from water, and he has left ample traces of this in not doing his work more thoroughly.

If it be said that *quartz*, the remaining constituent of granite, is deposited from water under our observation, it may be replied that it is so in its compounded state, and consists only of the two elements, silicon and oxygen. The fact, however, is directly opposed to the nebular hypothesis, and as directly in favor of the Biblical statement of solution. A simple solution of mica or of feldspar, could it be effected, would probably, like quartz, result in the same crystals on evaporating the water; but no such result would be obtained if any degree of decomposition should arise. But were it possible to form those complex substances out of their constituent elements, it would in no respect affect the impossibilities of the nebular hypothesis. Were the chemist to attempt their manufacture, it would be with their precise com-

ponent parts, not with their intermixture with fifty other elements. It is true that many crystals whose elementary constituents are, like quartz, very few in number, may be readily produced in the laboratory out of certain compounds, such as are formed by acids and alkaline bases, &c. But no one of them, nor any other to which the water of crystallization is necessary, can be produced by caloric. It must be from the state of some solution. It is alleged, however, in proof of the nebular hypothesis, that pyroxene and augite will crystallize from a state of fusion, as seen in lavas; but they contain no water. The same, also, may be affirmed of the simple crystalline substances, specular iron ore, titanium, &c., which are produced by volcanic and furnace heat. Whenever, also, any of these substances are composed of other elements than a metal and oxygen, such as pyroxene, they must exist naturally in that compounded condition. As such they are produced neither by volcanic nor furnace heat, but simply assume a crystalline condition after undergoing fusion.

But again: a greater difficulty. When Theoretical Geology starts with the union of the various elements into their symmetrical compounds, and begins its work of condensation, it necessarily supposes that they all existed, at that critical juncture, at a common temperature. Now what an unscientific condition of things is this for the supposed union of the elements, and the condensation of the compounds themselves. Take, in the first place, what is obvious to the senses of all, the metals, and some other things of easy comprehension. The lowest temperature which is necessary to maintain them in a gaseous state presents every variety beyond a degree which can not be artificially produced, to that low degree which will volatilize mercury, quicksilver, &c. And so, *vice versa*, are the differences of temperature at which they will respectively assume a fluid or a solid form.

How, then, did arsenic, lead, the ores of quicksilver, bismuth, tin, &c., solidify from their gaseous state, or only, if it be preferred, from a state of simple fusion, simultaneously with platinum, gold, &c., according to the requirements of the nebular hypothesis? Platinum is fusible only by the hydro-oxygen blow-pipe, and when, therefore, it condenses from a simply fluid to a solid

state, it is at thousands of degrees above the point of condensation for many of the other metals. But platinum occurs in connection with several other metals, some of which condense from their molten state at comparatively very low temperatures. How, then, got these metals in? The problem is as difficult for the igneous hypothesis as the presence of water in the crystalline rocks. But it is rendered still more difficult by the presence of four metals which are scarcely found anywhere else than as incorporated with platinum. By what possible chance, therefore, did these very rare metals disengage themselves from the universal gaseous mixture, and seek out platinum in its rare localities, and go nowhere else? And so of gold, which condenses from a state of fusion at a little below 2016° Fahr., its melting temperature. But gold is often alloyed with other metals, particularly with silver, tellurium, and mercury. How got these metals in, especially tellurium, which condenses at about 800°, and mercury, which subsides from a state of vapor at about 660°? And what farther of mercury? There are native amalgams with gold and silver; but, upon the nebular hypothesis, the mercurial element would have been far distant in a volatile state when the latter had consolidated. Cinnabar, or the sulphuret of mercury, is readily volatilized, and yet it is found in gneiss, from which it is driven off by a common forge. And arsenic, also, which volatilizes at 356°, without melting, occurs extensively and intimately incorporated with cobalt, iron, copper, lead, and silver, especially the two first. What, therefore, was just said of mercury is equally applicable to arsenic in its combinations with either of the foregoing metals. It abounds in cobalt, and this combination is mostly seen in mountains of granite, and in mica-slate, either in imbedded masses or in veins disseminated through the rocks. Metallic arsenic is also found in the midst of the primary rocks. In these rocks occur also, in great abundance, the sulphurets of iron and copper; and the process of smelting shows how readily the sulphur is driven off, and therefore how opposed is this combination to the nebular hypothesis. Lead, which condenses from a state of fusion at a little less than 612°, embraces in the numerous varieties of its ores sixteen other elementary substances, among which are gold, silver, sulphur, and phosphorus. Where would have been the last two when the metallic constituents underwent condensation?

I need not speak of the singular incompatibility of sodium, the base of marine salt, with water, nor of its presence in many minerals, nor dwell upon the fact that chlorine, the other element of marine salt, is a gaseous substance, and readily unites with water. But we may be content with the fact that chlorine is found only in combination with sodium, with the exception of some rare compounds of mercury, silver, and some other metals, and then only in a small quantity. But chemistry forms with this gas, next to oxygen, the most extensive series of combinations with other substances, for its affinities are such that it unites with nearly all the simple elements, metallic and non-metallic. Contrary to the laboratory, however, the nebular hypothesis supposes that this gas sought out and limited itself to sodium; when, without a miracle, it would have seized upon nearly all the elements in the Plutonic mixture. Consider, also, the obvious design in this limitation of chlorine to sodium, resulting in a compound indispensable to man and animals, and abundant in their fluids. It is, indeed, from common salt that we obtain, directly or indirectly, all the supplies of the various compounds of sodium. Again: so great is the affinity of chlorine for hydrogen gas, that, if mixed together at a high temperature, their union is sudden and attended by an explosion.

Potassium should also receive a brief consideration. This metal is found in about thirty species of minerals, and is a component part of feldspar, one of the most universal. Both heat and water are incompatible with it, and it exists in combination with oxygen in the form of potash. It burns with a vivid flame at a moderate heat, in the presence of oxygen, and equally so when it comes in contact with water. It is, therefore, very unnecessary to multiply remarks upon a subject of such obvious import.

Nor am I disposed to leave this fruitful topic without a more critical analysis, and glancing at those multifarious combinations of oxygen gas which, by their endless range of usefulness, and by their contrast with the limitation of chlorine to an union with sodium, declare as distinctly the direct exercise of Creative Power in the organization of the earth as it is manifest in the animal and vegetable tribes. We have seen that the two gases, oxygen and chlorine, have strong affinities for other gases, the metals, &c., and

readily combine with them. Upon this principle the nebular hypothesis assumes that oxygen elected all the nitrogen from the chaotic mixture and formed atmospheric air, but not through their chemical or any other affinities, for they exist in a state of simple intermixture; it assumes, also, that another portion of oxygen seized upon all the hydrogen to form water, to the exclusion of chlorine, which has a greater affinity for hydrogen; that other portions united with sulphur, carbon, &c., and formed most of the acids that exist in nature; while other portions entered into simple combinations with the metals and metalloids—forming the oxides of metals and the earths; but all existing at the time of these unions in a gaseous state, and all condensable at temperatures as various as the numerous elements and their combinations; and in this way, according to the nebular hypothesis, there ultimately emerged from the ignited chaotic mixture nearly the entire mineral kingdom, with all its exact adaptations to the various wants of living beings, and in which oxygen gas had a most important agency.

The same rule, therefore, should apply to any other substance situated like oxygen, and bearing strong relations to it in its affinities to other elements. In chlorine we have a test. From the amount of sea-salt, chlorine should have been one of the most abundant constituents of the chaotic mixture of elements. It possesses, also, as we have seen, a far more powerful affinity for the metals and metalloids than oxygen, and combines with most of them at the temperature of the atmosphere, and far more readily and rapidly when the temperature is raised. Here, then, it is seen at once that, instead of oxides of the metals and the abundance in which oxygen is incorporated in the substances that make up the primary crystalline rocks, there should have been chlorides, or at least an excess over the oxides. But the remarkable fact exists that chlorine is scarcely found in inorganic nature except in marine salt; and notwithstanding its affinities for most other elements, its combination with sodium is the only one it can form that is useful to man and animals.

Farther: how will the nebular hypothesis explain, upon any conceivable principle, the simultaneous union of oxygen with all the hydrogen, so as to form the waters of the oceans, and nearly all the chlorine of creation with nearly all the sodium (to say

nothing farther of the strong affinities of chlorine for hydrogen), and combined those two compounds together when their elements united? And what as to the formation of water itself, whose base is hydrogen gas—the element which is used for the inflation of balloons? It need not be said that hydrogen gas, as soon as created, would have been, according to the nebular hypothesis, forever beyond the reach of oxygen gas. There can, of course, be no evasion of these difficulties by assuming that oxygen united with the hydrogen, and the chlorine with the sodium, at some time after the condensation of the rocks, for this would greatly increase the absurdities of the hypothesis by rending it into fragments, and would be at once contradicted by the very water which enters into the structure of the primary rocks. But if such proof be not sufficient, then I say that under no possible circumstances could oxygen and hydrogen have got together so as to form water, unless *created in union.* This will be admitted when it is considered that the specific gravity of hydrogen is only about 68, while that of oxygen is greater than that of atmospheric air, being about 1102. Hence the rise of balloons. Nor should the reader fail of carrying this *weighty matter* of specific gravity into the entire constitution of the globe, and he will find that it crushes every theory of the earth's formation excepting the Mosaic.

Let us, however, assume, for the sake of the argument, that all the elementary gaseous substances that go to the formation of the primary rocks were capable of forming themselves into the special groups out of a nebular confusion, and of uniting into the various crystalline compounds of which these rocks are composed. How, then, upon the nebular hypothesis, did those component parts of granite, &c., which are fusible at very different temperatures, become consolidated at the same moment, as they necessarily must to have formed this compound rock? It is simply a physical impossibility—leaving out of the question the symmetrical arrangement of the different crystals side by side of each other. But let us now superadd the metals, and suppose the most infusible constituents of the incandescent mass, such as the primary rocks, platinum, gold, &c., to have been reduced to a fluid state; platinum, gold, iron, copper, &c., would have gravitated far below the metalliferous rocks which have been projected above

the surface, and they would have remained in a fluid state long after the rocks had consolidated; and as to antimony, mercury, arsenic, sulphur, which the primitive rocks embrace in some form or other, they would, of course, have continued suspended above the surface of the earth in a volatile state long after the condensation of the rocks, and would have finally settled down upon them in such blended alloys as would have rendered them nearly useless in the arts. And then, again, as to water and atmospheric air, these, of course, would have been the last in the order of disjointed results of the supposed igneous condition, especially water. And whence came the *hydrogen* for one, and *nitrogen* for the other? Information is here particularly desired, as there is no hydrogen excepting as it exists in water, and no nitrogen excepting in the atmosphere, in any sense relative to our subject.

In the mean time, it can not be doubted that the sun and moon would have established a tidal motion in the fluid mass, by which the blended condition of all things would have been, if possible, rocked into a more inexpressibly chaotic state than had resulted from the universal intermixture of the elementary substances. Miles in thickness of the consolidated earth must have obtained before the surface would have ceased to be shattered into fragments and embowelled in the liquid mass. Not a crystal could have formed from the centre to the circumference, for crystallization requires the most perfect repose. And such, indeed, as we have seen, would have been generally the result of an aqueous solution of the compounded materials had they been left to their own properties alone for their crystallization and the symmetrical arrangement of their crystals. Although all this is obvious from the effects of gravitation, the most important and uniform of the laws of nature, let us hear an authority which will not be questioned where facts are admitted in direct conflict with his own advocacy of the prevailing geological speculations. It is a good exemplification, also, of the difficulty with which facts are discerned and properly applied when it is feared that they may contradict a favorite hypothesis. I refer to the distinguished BAKEWELL, who, in his elaborate work on *Geology*, remarks that—

"There are certainly circumstances that favor the theory of central heat; but *it must be confessed* that it is also accompanied with difficulties not easily to be removed. If the earth be com-

posed of a solid crust or shell surrounding a fluid mass, this internal fluid would be subjected to the attraction of the sun and moon; or, in other words, would have its regular tides. We are not acquainted with any counteracting influence to prevent the impulse of these tides upon the solid shell."

And here is another, a late and high authority to the same effect—Dr. C. F. WINSLOW. In his work on *Force and Nature* he elaborates the doctrine relative to volcanoes, and the result is expressed as follows:

"I have endeavored to show that this planet is not only *not solid* throughout, but that its interior conditions are both fluid and *actively mobile* and elastic; that these elastic matters are contained as a *boiling, surging* nucleus within a *crystallized* shell; that this shell is pierced in many places, and is *universally subject to tension, blows, shocks, fissures, faults, cleavages, and fluctuations of outline*, in consequence of contractions and reactions of its fluid nucleus."

That is a very accurate description of the progressive formation of the globe according to the nebular hypothesis. Such, exactly, would have been the condition of the earth as soon as cooled down to a fluid state, and such the effects of the tidal motions — unceasingly churning together all the materials of the molten, "boiling, surging nucleus." If, also, the supposed motions of the interior of the earth produce the effects upon "the *crystallized* shell" that are represented by our Author, the reader will have no difficulty in seeing the impossibility of the formation of a shell in a "crystallized" condition. But our Author in thus demolishing the nebular hypothesis was employed in sustaining another with a view to its confirmation. This, however, is only an example of many other assumptions, having the same object in view, that have been brought into conflict with each other. With the design of applying the results of volcanic action to the advantage of the nebular hypothesis, the disturbance of the earth's surface is apt to be much exaggerated. Moreover, all the attendants of volcanic eruptions are readily susceptible of explanation by the decompositions which are at work in various quarters of the globe in its solid contents—resulting in the production of heat, explosive forces, &c.

It is remarkable, also, that Sir CHARLES LYELL, who believes

in the igneous formation of granite, controverts the doctrine of an existing molten state of the interior of the earth, and turns against it the admitted necessity of a tidal movement—although this imputed source of "central heat" was important to his supposed universal tropical temperature at the era of the coal-formations. Our Author, in the first place, quotes Cordier's estimate that, "when the fluidity of the globe was perfect (or when it had cooled down from its nebulous to a fluid state), the rise and fall of those ancient *land* tides could not have been less than from thirteen to sixteen feet." He then goes on to say—

"Now, granting, for a moment, that these tides in the internal melted ocean have become so feeble as to be incapable of lifting up every six hours the fissured shell of the earth, may we not ask whether, during eruptions, jets of lava ought not to be thrown up from the craters of volcanoes, when the tides rise? and whether the same phenomena would not be conspicuous in Stromboli, where there is always lava boiling in the crater? Ought not the fluid, if connected with the interior ocean, to disappear on the ebbing of its tides?"

Although the foregoing appears to be the only objection which Theoretical Geology has suggested with any force against the supposed "internal melted ocean," the reader will not fail to appreciate the value of the admitted tidal motion in connection with the more demonstrative facts and arguments which I shall have produced against the supposed formation of the earth out of a fiery, nebulous condition; while the tidal motion alone is all-sufficient to show the impossibility of the formation of the symmetrical crystalline rocks, which compose the great mass of the globe, from a fluid condition, whether in the form of a melted mass or of aqueous solution, without the direct co-operating agency of Creative Power.

But a word more as to Sir CHARLES LYELL'S difficulty with the reputed molten interior of the earth. M. CORDIER estimates the heat of the earth's centre at 450,000° Fahr., and this is a serious obstacle with Sir Charles to the "Glacial Theory," so important a substitute for the Mosaic Narrative of the Flood in expounding the distribution of the boulders and other diluvial drift; while the same logician requires, at another time, an exalted temperature of the earth for the completion of the primary schistose

rocks, and for the universal growth of tropical plants at the "carboniferous era," although contradicted in the latter case by the simultaneous growth of plants that are now peculiar to high northern climates. (See Appendix III.)

What I have suggested in regard to the *water of crystallization* may be applied with a crushing effect against the nebular hypothesis, if, indeed, the force of the objection have not been already appreciated by the reader. Whence, I ask, came the water which abounds in granite and other crystalline rocks? Where was it when the rocks were consolidated at a temperature of thousands of degrees above that of steam, or how could the rocks have crystallized without it? If there be any remaining virtue in facts, in their conflict with error, this one alone proves the original existence of the primitive rocks in a state of solution by *that water*, in part, which we find thus incorporated, and which the Word of God has declared to have been blended with the other materials of the globe in its chaotic state; though I do not now present the latter as an authority. Theoretical Geology has sometimes, in its perplexities about the primitive rocks, drifted away from the *nebular* hypothesis, and in some unexplained manner brought the crystalline rocks into a state of fusion under a vast superincumbent weight of water, without any notable object, and thus assuming the existence of water against the plainest impossibilities. Even the vigilant Professor Silliman, in his Appendix to Bakewell's Geology, falls into the following remark:

"If granite had been melted under atmospheric pressure alone, or when there was no atmosphere, its surface would have been inflated and porous, like the upper current of lithoid lavas; but if melted under the pressure of water, it may be, of several miles in height, it would, on cooling from fusion, crystallize, and become, as we see it, a solid mass." That it would have become "a solid mass" is indisputable; but it would have been a mass of all things, *excepting water*, blended in intimate mixture, without any crystallization whatever.

Theoretical Geology, however, is not yet convinced; and we will, therefore, try this question by the undoubted igneous rocks, which have come into this condition since the completion of the globe—trap and basalt, for example. Here the primary crystalline rock has been fused by volcanic heat into an apparently

almost homogeneous mass, all crystalline structure obliterated, and the water of crystallization dissipated. Examples of this occur in the lofty range of trap and basalt which form the "Palisades," in the immediate vicinity of New York, where the original rock, a syenitic granite, is occasionally found adherent in small masses. This primitive rock is composed of four crystals—quartz, feldspar, mica, and hornblende, distinctly formed and in juxtaposition. I have detached this rock from the trap, and upon placing it upon burning anthracite coal fused it into trap—thus obliterating the crystalline structure. Here, too, is exemplified the fact that the higher the temperature the more impossible would it have been for the primitive rocks to have assumed a crystalline structure, since the appearance of that structure is more perfectly obliterated in the basalt than in the trap. This difference of temperature is also shown by its effects upon the granular, sedimentary, fusible stratum through which the Palisades have been obtruded, as those portions which lie in contact with the basalt are far more extensively fused and consolidated than such as are contiguous to the trap. Probably no other similar formation supplies so good an opportunity of observing the volcanic origin of trap and basalt, and the effects of heat upon the primitive rock in converting it into those conditions; for in this locality there exists the concurrent evidence of an absolute fusion of the original rock, and that which is supplied by the fusion of the aqueous deposit of the disintegrated granitic rock through which the trap has been erupted. In this locality is demonstrated, also, the geological error that "granitic and trap rocks pass into each other." In certain other localities large masses of granitic rocks, possessing their natural crystalline structure, are found associated with masses of trap. Here the granitic rock has been subjected to a fusible heat only in one or more sections, not almost universally, as in the Palisades of the Hudson River; and Theoretical Geology, without reference to the crystallized condition in one portion and its obliteration in the other, converts its fallacious inference into an important fact for the igneous origin of granite. It is thus said by Sir CHARLES LYELL, that—

"It would be easy to multiply examples to prove that the granitic and trap rocks pass into each other, and are merely

different forms which *the same elements have assumed*, according to the different circumstances under which they have consolidated from a state of fusion." Fallacies of this nature are destined to bring upon Geology a settled distrust of its statements of the most important facts.

It will be of no avail to Theoretical Geology that masses of basalt often assume, on cooling, a prismatic form; for its original constituent parts have become intimately incorporated together, without water of crystallization, and equivalent to a substance as simple as platinum or gold with the several other incorporated metals. And how clearly does this prove the fallacy of the geological interpretation of the seams of quartz, feldspar, &c., that often traverse large masses of granite and gneiss, which assumes that they have been injected, in a state of fusion, into imaginary fissures; although, also, they often appear like net-work, and are in a perfectly crystalline condition. And here we may derive from Theoretical Geology another very satisfactory proof that the granitic veins have never been in a state of fusion, and that the stratified rocks to which the following quotation refers were of contemporaneous origin, and were owing to the same violent causes, as will soon appear yet farther. The quotation simply expresses what is common in works upon Geology. Thus it is said that—

"The veins of granite are of every size and shape, and *they run in all directions* through the superincumbent strata; and similar irregularities exist in larger and less ramified masses. True, they are *rarely superincumbent* upon the stratified rocks, and hence some have inferred that they could not have been erupted like lava, which often spreads over the surface to a great extent." —Prof. HITCHCOCK'S *Geology of Massachusetts.* And so, also, Lyell, and others.

Granite is said to have been occasionally, though very rarely, found overlying stratified rocks and even chalk, and has been seen in the form of veins in stratified limestone; which has been attributed to the eruption of granite in a state of fusion. But it has resulted from the disintegration of granite and the action of water, as in the case of the veins which appear in stratified rocks. The following example from Sir CHARLES LYELL'S *Geology* will show us how it is done, and a subsequent consolidation

upon a large scale. Thus—"This disintegration of granite is a striking feature of large districts in Auvergne. The rock may with propriety be said to have the rot, for it crumbles to pieces in the hand." But notwithstanding this, Sir Charles, for the purpose of showing that granite is sometimes injected in a state of fusion into stratified limestone, with its crystals unimpaired, presents "a diagram from a sketch of Dr. McCulloch, representing the junction of the granite of Glen Tilt with a mass of stratified limestone and schist." On turning to McCulloch's account of the formation, we find that it is a mass of rubbish occasioned by the "rotting" of granite and its transportation by water along with the other materials. Thus, Dr. McCulloch—

"In *every instance* all particular and minute regularity disappears whenever the limestone beds are found in the immediate vicinity of the granite. They are so *intermingled and blended* with the accompanying strata and with the granite that *the whole mass appears to be in a state of utter confusion.*"

I shall now reproduce an objection to the igneous hypothesis that it may be more fully considered; and it will be seen to apply equally to the old Neptunian, or to any other hypothesis which excludes the direct interposition of Creative Energy, and to operate as a physical impossibility against every doctrine in cosmography but the Mosaic. The reader will also observe that the objection is more or less associated with such as have been already alleged, and should be considered in connection with them.

We will take granite for our demonstration. Here we find, as already seen, three unique crystalline compounds universally present, side by side, individually and collectively, *in the very bosoms of each other*, compactly joined but not agglutinated; and equally so in the lowest depths of the universal mass as at the surface. Now, it will be seen, upon a moment's reflection, which appears never to have been bestowed upon the subject, that it is physically impossible that those very diverse constituent parts should have been thus evolved out of either a state of fusion or of solution, and methodically arranged in juxtaposition by any natural process alone; while the nebular hypothesis must take along with it the crushing assumption that the numerous elements of mica and feldspar *condensed simultaneously* into those

component parts and *side by side of each other*, along with the less complex quartz, throughout the universal rock—never intermingling, and never resulting in any other compound in all the granite of the globe. Nevertheless, the crystals often penetrate each other, but without coalescing, which, as Theoretical Geology admits, "proves that they were all consolidated and crystallized at the same time." It is not only an absurdity to suppose that the elements could have emerged from the general mixture so as to have formed the crystalline compounds, but equally so that the elements could have cooled down simultaneously so as to form the compounds into a fluid state, or that the compounds thus formed could have cooled down simultaneously to the condition of solids—so very different from each other are the temperatures at which the elements exist in a gaseous state, or the crystalline compounds in a state of fusion. But could this condition of things have obtained, we are then met by the certainty that the fluid mass, whether in a state of fusion or of solution, must have been incorporated in all its parts, without the aid of Creative Energy.

Admitting, however, a sort of instinctive separation of the elements from their supposed chaotic mixture, so as to have formed *isolated spots* of fluid matter ready to be consolidated simultaneously into mica, feldspar, and quartz, as well as the accompanying metals, &c., and granting, also, the farther physical impossibility of the water of crystallization, the assumption that these spots arranged themselves to undergo simultaneous consolidation into the three distinct crystalline substances that make up the universal granite, and these three crystals occupying a combined and systematic relation, all side by side, individually and collectively, throughout the great mass of the globe, is as absurd as the assumption that man, animals, and plants came into being through a natural coalescence of their elements. (See Chapter VII.)

If we glance for a moment at syenite, where hornblende is either substituted for mica, or at other times is associated as a fourth crystal with the other component parts of granite, or the substitution of chlorite for mica in another variety of granite, astonishment increases at this diversity of organization. And although, as we have seen, on the one hand, if mica, or feldspar, or hornblende, were subjected to *fusion*, their condition as

such would be obliterated; and, on the other hand, if either could be dissolved in *water* in a separate state, each one would probably come out again the same thing after slow evaporation; yet, could a fragment of granite be thus dissolved, all the crystals, on a like evaporation, would be either blended into one apparently homogeneous mass, as would occur in a state of fusion, or, more probably, a partial intermixture only, while a larger proportion of each crystal would be superimposed upon that which is least soluble respectively, since the order of their deposition depends upon their relative solubility. To restore the fragment of granite, therefore, from a state of solution or of fusion would require the interposition of Creative Energy. The Chemist, however, may as reasonably undertake this experiment as he has attempted the fabrication of living beings (Chapter VII.). Moreover, as to the old Neptunian doctrine, another insuperable objection presents itself in the fact that the deposition of the crystals could not take place without *an evaporation of the water*. So, therefore, according to our doctrine of solution, unless Creative Energy had interposed, there could have been no formation of granite or other rocks without an evaporation of the waters that held them in solution. But, notwithstanding no such evaporation has occurred, all the mica, feldspar, hornblende, &c., has totally disappeared from the oceans, and nothing remains in union with their waters but those very soluble substances, chloride and sulphate of soda, calcareous salts, &c. There remains, therefore, the alternative only of supposing that Creative Power brought the constituents of granite, &c., into being in a state of aqueous solution, and then proceeded, by the continued exercise of His Power, to bring about their systematic organization by co-operating with the natural operation of the properties which He had impressed upon matter; or, that He created the primary rocks in the condition in which they now exist—the latter of which is contradicted not only by the principles of Design, as denoted by the other progressive works of Creation, but by the constitution of the rocks and other surrounding facts. And why should not the Creator have proceeded with His work in respect to the earth with as much consistency as He demonstrably did in a direct creation of man, animals, and plants *out of the materials of the earth?* Nevertheless, having created the component parts of the earth in

a state of solution, it was characteristic of a Designing Power that he should employ their inherent properties, so far as adequate, in bringing them into their organized condition; just as He used the materials of the earth in creating living beings; while, in respect to the latter, the elements of matter having none of the properties of life, the production of those properties was more exclusively a direct act of Creative Power. (See Chapters VI. and VII.) "True it is," says Theoretical Geology through one of its almost reluctant advocates, "Creative Power could call the rocks into being; but no analogy countenances the truth of such a supposition." But that is a totally different view of the case from my doctrine of the exercise of Creative Power through the instrumentality of the properties of matter, and through which the results are closely allied to such as arise from the natural operation of the properties.

In stating the component parts of the primary rocks, I should have adverted to their adventitious decorations, the garnets, topazes, tourmalines, emeralds, &c., which go with the rest in declaring the necessity of an aqueous solution, and of their consolidation, as we have seen of accompanying metals, at the moment when the containing rocks were solidified.* Nor should I neglect, in the foregoing connection, an insuperable objection to the nebular hypothesis which is supplied by Professor TYNDALL, though not so intended. It occurs in his work on "*Heat considered as a Mode of Motion.*" Thus—

"If the Sun," he says, "be formed of matter like our Earth, some means must exist of *restoring to him his wasted power.* The facts are so extraordinary that the soberest hypothesis regarding them must appear wild." "*No earthly substance* with which we

* My Essay on "Theoretical Geology" embracing the arguments in the foregoing text against the nebular or igneous hypothesis, as derived from the constitution of the crystalline rocks, appeared originally, and in all the details as here presented, in the New York *Protestant Episcopal Quarterly Review* for April, 1856, occupying 120 pages of that number; and immediately afterwards the work was published in a distinct form. More than a year subsequently there was published in New York a work entitled "DAVIES' COSMOGONY, OR MYSTERIES OF CREATION," without date upon the title-page, but bearing a record of 1857 as the date of the *Copyright*, in which an outline of the argument relative to the differences of temperature at which the elementary substances, metals, &c., consolidate, and of the argument as to the constituent crystals of granitic rocks, appear as original.

are acquainted—no substance which the fall of meteors has landed upon the Earth—would be at all competent to maintain the Sun's combustion. Were the Sun a solid block of coal, and were it allowed a sufficient supply of oxygen to enable it to burn at the rate necessary to produce the observed emission, it would be utterly consumed in five thousand years."

Now apply these calculations to the nebular hypothesis of the formation of the earth and other planets, which supposes that the circumference of the Sun cooled down into consolidated rings, which then became detached, and rolled up into the several planets respectively; though in most instances, as these orbs continued to cool, it is supposed that rings from their exterior were cast off to form the satellites. The crystallization of the rocks, with their *water* of crystallization, is necessarily supposed to have begun while the semi-consolidated rings were still attached to the Sun. But apart from that consideration, the inconceivable intensity of the Sun's heat as estimated by our high authority, in the foregoing quotation, will scarcely be considered favorable to the *cooling* process!

Either hypothesis, therefore, the Plutonic or nebular, and the old Neptunian, particularly the former, is demonstrably absurd throughout, even in respect to the smallest fragment of granite. And when, again, we consider that this rock and its varieties make up the great mass of the globe, and that they are everywhere essentially the same, Science revolts at the hypothesis, and proclaims the attendant facts as an incontrovertible proof of Creative Power, and holds them up in confirmation of that literal interpretation of the Mosaic Narrative which it is our object to establish. Even Theoretical Geology, when soliloquizing upon these things, stands aghast at the difficulties before it. Let us, however, speak, as always, by the book, and now as hitherto a distinguished book, whose Author, at the very moment of assuming that granite rocks were of *igneous* origin, and contrasting them with the known products of volcanoes, says:

"We are compelled to admit that the conditions under which the two kinds of igneous rocks have been formed have not been the same." "There appears to have been SOMETHING *in the condition of the world at the earliest times* CAUSING certain compounds (that is, granitic rocks) to be formed in great abundance which

does not now continue in such force as to permit the production of similar compounds. *What that condition of things* may have been we do not as yet appear to have any *definite ideas.*" He remarks, also, that no granite has ever been known to have been ejected from any of the existing two hundred volcanoes.—DE LA BECHE'S *Geology.*

And to the same effect Sir CHARLES LYELL—"Nothing *strictly* analogous [certainly in no respect analogous] to the primary crystalline rocks can now be seen in the progress of formation on the habitable surface of the earth; nothing at least within the range of human observation."—*Principles*, &c.

How, then, can Sir Charles affirm, in consideration of his hypothesis of the igneous formation of granite, that—"In our attempt to unravel difficult questions we shall adopt a different course from the earlier inquirers, *restricting ourselves to the known or possible operation of existing causes.*"—*Principles*, &c.

The same admission may be found in most geological works of authority. One more may be stated. Thus, Prof. HITCHCOCK, in his *Geology*—"We have no evidence that the most important of the older rocks, both stratified and unstratified, are produced by any causes now in operation."

From all which it results that the truly Plutonic or igneous rocks, such as are ejected from volcanoes, or occur in the form of trap and basalt, offer none of the assumed analogies to the primary crystalline rocks, and supply no ground for the geological induction as to their formation.

Let us now recapitulate some of the important points in the foregoing demonstration: 1. That the primary rocks, the foundation-work of the globe, are made up of crystals. 2. That the predominant, or granite, is composed of feldspar, mica, and quartz. 3. That in syenite hornblende is generally substituted for mica, but that in many instances the four crystals appear in connection. 4. That the crystals are composed of numerous elements. 5. That the several crystalline compounds are arranged side by side, in systematic order, but in no respect united, which proves that they have never been melted, and that they must have been compounded and so arranged through the instrumentality of Creative Power. 6. That the same structure of the rocks shows that the properties impressed upon the

materials were rendered instrumental in bringing the rocks into their organized condition. 7. That these rocks often embrace crystals of topaz, garnets, emeralds, tourmalines, &c. 8. That the rocks contain various metallic substances, among which are the very volatile arsenic and mercury. 9. That all the crystals are impregnated with water. 10. That, in respect to the nebular hypothesis, all the constituents, both in their elementary and compounded conditions, are condensible at very different temperatures, all the way from many thousand degrees down to that of boiling water, while the rocks declare in every detail that they underwent consolidation in all their parts *at the same moment.* 11. That the veins of granite, mica-slate, gneiss, and of metals and metallic ores which traverse the primary unstratified rocks, also demonstrate not only a simultaneous formation, but a sudden condensation of the entire rock, since otherwise the veins would have intermingled with the general mass; and nothing can be more opposed by the surrounding facts than the hypothesis of their subsequent interjection in a molten state. 12. That the crystalline condition of the rocks, along with the water of crystallization, &c., render it certain that they must have been originally in a state of aqueous solution, and that at no time have they been subjected to the action of a fusible heat. 13. That by no possible process, natural or artificial, can the component crystals of the primitive rocks, so different from each other, be brought into their existing relations in a small fragment of granite. 14. That whether in a state of solution or of fusion, the constituent parts would have been indistinguishably blended together without the intervention of Creative Power. 15. That the tidal action of the moon and sun would have rendered "confusion more confounded." 16. That the conversion of granitic rocks into trap and basalt by a fusible heat disproves the igneous hypothesis. 17. That the considerations now mentioned prove the creation of the elements in chemical union in each of the crystals. 18. That all crystals containing water, as observed in natural progress, or as produced artificially, are deposited from solutions either of water or of which water is a component part. 19. That inscrutable conditions exist naturally by which mineral compounds become dissolved in water, and in a highly concentrated state, as in the case of quartz, but which can not be

imitated by art; all of which coincides with the evidences supplied by the primary crystalline rocks of their original conditions. 20. That the sedimentary deposits of limestone, &c., were in rapid progress at an early day, on account of the abundance of these materials which were held in solution after the organization of the earth was completed; and this rapid and extensive deposition of those more soluble earths contributes to the proof of an original solution of the crystalline rocks, since it shows that solvent principles had been suddenly withdrawn from the water and incorporated in the crystalline compounds. 21. That the *abundance of created* aquatic animals, and the rapid multiplication of the testacea and their immobility, explain their incarceration in the limestone rocks, according to the progressive formation of the latter.

In regard to the nebular hypothesis, some doubts were engendered when Lord Rosse's telescope resolved the supposed nebulæ into systems of worlds. It came in good time to prompt the following comment in a distinguished work upon the "*Typical Forms of Creation*," by the Rev. Dr. McCosh and Dr. Dickie, but in vain. Thus—

"It may be asserted, *without any risk of contradiction*, that nowhere within the wide knowable space (the heavens) do we discover even the semblance of chance, confusion, lawlessness, or oversight. Nay, it may be now most emphatically affirmed, that *nowhere* within this extensive region, or in the *long ages* opened up to us by the time which light requires to travel from different stars, do we discover *any traces of chance* now existing, or ever having existed, or of *worlds being formed by natural law, or of worlds only half formed or even in the course of formation*, or of any object overlooked, or out of place, or not in harmony with all the rest."

If then our Authors revolt from the formation of worlds out of a chaotic state "by natural law," why not at least equally so from the application of such a *law* to the progressive development of animals and plants? Our Authors even sanction the hypothetical carbonic-acid atmosphere of the "carboniferous epoch," which, they say, "enabled the plants to build up their organs and add to their carbonaceous ingredients, while they were, at the same time, preparing the way for the *advent of ani-*

mals by subtracting the excess of *a gas noxious* to animal life"!! —thus disregarding, also, the "Reign of Fishes," which preceded the "carboniferous epoch," and the "Reign of Serpents," which, it is said, "were then the Masters of Creation."

The nebular hypothesis came, for a brief time, almost to a pause. We were admonished by another disciple of Theoretical Geology that—"The nebular theory, properly so called, which seeks to explain the physical conditions of the solar system by the laws of mechanics, and the condensation of a vaporous mass of ether, *requires great caution*, that people may not *mistake a cloud for a goddess, and accept a series of ingenious sophisms for scientific demonstration.*"—*London Christian Observer*, March, 1856.

Much was also expected from an attack made upon Laplace's nebular hypothesis by Sir John Herschell before the British Association for the Advancement of Science, in 1845, who exposed its fallacy upon astronomical grounds, but of which I have not availed myself.

In 1849 I congratulated Theoretical Geology upon the advent of Rosse's telescope in the following manner: "It has been said that 'an undevout astronomer is mad.' But we have looked with complacency upon marshalling a chaos of stars into systems of worlds, that Science might pluck a laurel from Heaven to give it back again to the stupendous law of gravitation; and we have looked with complacency upon the nebular hypothesis. Reason has been neither shocked, nor the astronomer considered 'mad;' although a multitude of worlds are seen when we mount the stellar heavens upon the analogies supplied by our own planet. In this relative sense a series of vast designs crowd upon enlightened reason, and he who is true to his reason must come to the conclusion, as expressed by Byron, that it is with every star as with the earth—

"'Such as Creation's dawn beheld thou rollest now.'

"Such, indeed, is the conclusion to which the astronomer is fast finding his way by his own mechanical inventions. Those *nebulæ*, so long regarded as a gaseous fire, destined to grow into systems like our own (one of which, according to Arago, would have occupied all space), are now seen as a "powdering of stars," receding in the distance, pile upon pile, as if a cone

stretching out beyond the bounds of imagination. But reason, the analogies of Nature, Unity of Design in the great plan of Creation, have had no part in the astronomer's conversion from a chaotic state of the heavens to a symmetry of worlds. The telescope alone will have dispelled his illusion; but it will have gained a fact which goes with all former knowledge in proving that every fabric of the human mind which is entitled to the appellation of a science is founded in consummate Design. The astronomer, it is true, still clings to the vestige of his dream, and lingers upon the fathomless abyss of light where myriads of stars mingle their effulgence to his physical eye; but he lingers with a hope which the very next step he may take in mechanical optics will prove to have been as faithless as his former visions, and will carry him upward and onward through other telescopic worlds, but forever bounded by the halo which had been the *ignis fatuus* of his philosophy.

"However beautiful, therefore, the nebular hypothesis of Creation, and however reluctant its surrender to the glory of the Almighty, it must fall, and with greater precipitation than it rose; for the astronomer himself is demolishing the fabric. And with it must pass into oblivion the whole Plutonic scheme of the earth's formation, so long an analogical basis of the nebular theory of the heavens; or only remembered among those eighty other systems in Geology which were grouped under one general condemnation by the French Institute (p. 320).

"The astronomer, however, enjoys a pretext for his factitious philosophy far beyond the propagandist of materialism and spontaneous generation. The former may see in matter and its laws a Creative Power, and imagine, in opposition to all that is known of secondary causes, that He Who 'spake and it was done,' Who tells us that '*Thus* the heavens and the earth were *finished*, and all the host of them,' did, nevertheless, consign His chaotic work, with all its ultimate designs as a symmetrical whole, and in its vast and critical relations to life, to the operation of the laws impressed upon it. He may 'see gods in clouds, and hear them in the wind.' His inquiry may stop there; and, overlooking all final causes, he may confound the agencies of matter with Creative Energy. But not so with the Physiologist, for the organic being, whether in reason, instinct,

organization, functions, properties, laws, is the embodiment of Infinite Wisdom."

It may be expected that something should be said of the primary schistose rocks, gneiss, mica-slate, &c.; although it is not important to the subject before us. These rocks are so intimately associated with granite, often blended with it in a variety of conditions, and some of them, especially gneiss, are so analogous to granite in composition, that they must be regarded as nearly coeval with it, and as falling under a common rule of interpretation. Their contemporaneous formation, indeed, has been advocated by some geologists, as in the able work by Dr. BOASE; and others who defend the igneous hypothesis regard the subject as an "enigma" that should be wisely avoided. Thus Sir C. Lyell—

"If we attribute the stratification of gneiss, mica-schist, and other associated rocks, to sedimentary deposition from a fluid, we encounter this difficulty, that there is often a *transition* from gneiss, a member of the stratified and therefore sedimentary series, *into granite*, which, as I have shown, *is of igneous origin.* Gneiss is composed of the same ingredients as granite, and its texture is *equally crystalline.* It sometimes occurs in thick beds, and in these the rock is often *quite undistinguishable*, in hand specimens, *from granite;* yet the lines of stratification are still evident. *These lines*, it is conceived, imply *deposition from water; while the passage into granite* would lead us to infer an *igneous origin.* In what manner, then, can these apparently conflicting views be reconciled?"

Our Author then proceeds to answer his interrogatory by availing himself of the licenses and contradictions of Theoretical Geology. He supposes a *primary* solution of gneiss in water, but is obliged, by his igneous theory of the formation of granite, and the exact similarity in the structure of that rock and of gneiss, to have an ultimate recourse to the agency of heat, through which, as I have demonstrated, the crystalline structure would have been obliterated. Thus, Sir Charles—

"The Huttonian hypothesis offers, I think, the only satisfactory solution of this problem. According to that theory the materials of gneiss were *originally deposited from water* in the usual form of aqueous strata; but these strata were subsequently altered by subterranean heat, so as to assume a new texture."

A particular fact, as we have already seen, is often the foundation of an important hypothesis in Theoretical Geology, although contradicted by other facts. In the case before us, a particular fact renders Sir Charles doubtful as to which preceded the other, the oldest "*secondary rocks*," or the *molten granite.*

"I have already remarked," he says, "that *some granite* must have existed before the most ancient of our secondary rocks, because some of the latter contain rounded pebbles of granite. But for the existence of such evidence we might not have felt assured that *all the granite* which we see was not PROTRUDED from below IN A STATE OF FUSION SUBSEQUENTLY *to the origin of the secondary strata.*"!!—*Principles*, &c. Whence would have come the requisite heat!

And yet Sir Charles on another occasion, and to meet another difficulty, controverts, as we have seen, the doctrine of central heat (p. 580), as also in the following quotations from his *Principles of Geology:*

"If the central heat," he says, "were as intense as is represented, there must be a circulation of currents tending to equalize the temperature of the resulting fluid, and the solid crust itself would be melted. Instead of AN ORIGINAL CENTRAL HEAT we may, perhaps, refer the heat of the interior to *chemical changes* constantly going on in the *earth's crust.*"

But may it not be asked, what is meant by the "earth's crust" if there be no molten interior? And, moreover, how such a crust could have been formed according to our Author's real doctrine of an original molten state of the globe, while he argues, as above, that the supposed existing central heat "would melt the solid crust itself?"

Theoretical Geology leaves the primary stratified rocks not only unexplained, but in a condition that imperils its hypothesis of the formation of the primitive unstratified rocks; though, whatever their cause, it assumes millions of years for their production. But by ascertaining their cause it will be seen that they may be brought within a very brief space of time, and immediately consequent upon the organization of the unstratified rocks.

We have seen that it is demonstrable that the unstratified rocks were organized from an aqueous solution through the in-

herent properties of matter in connection with a direct act of Creative Energy, giving to them that special determination which was indispensable to the organized condition; and we have seen that this conjoint action of Creative Power and second causes is what reason infers, in the case before us, as to the economy of God's Providence and Unity of Design; while Creative Energy was alone concerned in the production of living beings, since the elements of matter were not endowed with the properties of life (Chapter VII.). Nor can we hesitate in supposing that while the work of Creation was in progress its Author would carry out His direct instrumentality, as far as consistent with the details of its progress, until the work was completed, and pronounced at each step "*to be good*," and, on a final survey, that "*God saw every thing that He had made, and behold it was very good.*"

We have seen, also, that a sudden condensation of the primitive rocks would be necessarily productive of such an amount of vapors and gases internally as to occasion an early eruption of the mountain-ranges, and that these mountains in any thing like their extent could have had no existence without such a cause, thus proving by themselves a sudden condensation of the earth, and therefore a direct Act of Creative Energy. This brings us to the primary stratified rocks, gneiss, mica-slate, &c., which are of vast importance to animated nature, especially to plants; and herein is a far greater evidence of Design than that which Theoretical Geology professes so much to admire in the superficial position of the metals for the uses of man, but from which it excludes all Providential aid. Now, although it is very reasonable to suppose, in the case of the primary stratified rocks, that the Creator went on with His direct instrumentality as far as required for their speedy completion, it is unnecessary to infer any other agency than that of the causes which grew out of the plan of the unstratified rocks, since, from the condition of the stratified, it is inferable that that plan embraced a reference to such natural causes as would be adequate in themselves to effect the stratification. That such was the case is rendered apparent not only by the condition of the strata, but by those violent causes which must have been set in operation by the sudden condensation of the unstratified rocks. The lashing and tumbling of the

waters, and "gathering them into seas," is all that is necessary to explain the phenomena, and to relieve Theoretical Geology of its perplexities in regard to those "violent causes which," it admits, "were in early operation, but which finally disappeared forever." Indeed, if the primitive rocks were solidified according to our demonstration, they must have been superficially disintegrated by the violence of the waters while in that soft condition which our theory supposes, and the detritus have been deposited exactly as we find it. In this particular respect there is no difference between us and Theoretical Geology, for it is obliged to surmise the existence of unaccountable and universal torrents of water, whose causes are among the most embarrassing of its "enigmas." But that is not all; for there are other special "enigmas" attending the stratification—such as a frequent blending of the stratified and unstratified rocks, or, as Geology has it, "passing into each other"—blocks of granite, also, imbedded in the strata, and, worse than all, something like unstratified granite or syenite overlying the stratified. But the explanation just rendered of the causes of the stratification, and the nearly simultaneous formation of the stratified and unstratified rocks, explains the problems as a natural consequence. Thus, therefore, the primary stratified rocks come to the proof of the sudden condensation of the unstratified rocks. This "Gordian knot" may be, therefore, unravelled without resorting to Alexander's expedient. And thus, also, we obtain at once from the same causes that sedimentary deposit upon the surface of the rocks, in a pulverulent state, of the component materials of the rocks that was necessary to the vegetable kingdom (p. 480).

Nevertheless, it is more than probable that, after such turbulent action as attended the consolidation of the earth, the upheaval of the great mountain-ranges, and the somewhat later sub-alpine chains, and still later minor elevations, there would remain upon various parts of the surface of the globe vast accumulations of water, to ultimately wend their way to the ocean, after everywhere depositing a variety of sedimentary strata abounding with the exuviæ of testaceous animals, and hurling destruction before them as they burst their confines in the oldest valleys, to be progressively arrested by others formed by later

upheavals that were greatly composed of sedimentary deposits and fossil exuviæ from the ocean itself, and from which, as will be seen, the coal-formations derived their mineral strata. (Appendix III.) These minor hills, which studded the earth, were elevated by the almost exhausted causes of the mountain-ranges, and whose final operation did not happen, most opportunely, till the ocean had deposited its plastic limestone, and other materials that have yielded their bounties to the vegetable world and to the uses of man, both as the hills exist at present and as others were demolished and stratified when the barriers gave way to the pent-up waters. And to these sources of the superficial sedimentary strata must be added those which have come into view through recessions of the ocean.

Who, therefore, shall presume to say that extraordinary causes were not comprehended in the Creator's plan of organizing the earth that will explain all the undoubted sedimentary strata, as well as the primary stratified rocks, without assuming the present operations of nature as a ground of analogy for the geological ages? Some advocates of the geological periods are disposed to concede that the agencies which brought about the different series of strata were of such violence that all were accomplished in a shorter time than generally allowed by Theoretical Geology. Bakewell, for example, after indicating the rapidity with which chalk is deposited, remarks that—

"My object in directing the attention of Geologists to this subject is, to show that strata may be formed more rapidly than they are generally disposed to believe, and that the *feeble operation* of natural causes in our own times, however similar in kind, *bear no proportion in intensity to the mighty agents* that formed the ancient crust of the globe."—*Geology.*

There is also before us a fact which appears to be conclusive of the rapidity with which the fossiliferous rocks were deposited, and with which they underwent condensation. These rocks are found as low down as the primitive formations, and they all embrace the exuviæ of animals and plants in a state of good preservation. Nor is the condition of the fossils limited to particular localities, but is universal. It is, therefore, manifest that the beings of which they are the representatives were quickly imbedded in the mineral substances which contain them; all of

which will appear more clearly in our Appendix on the Coal-formations. The whole scheme of geological epochs, however, professing to rest upon the strata and the fossils, has grown out of the doctrine of the slow formation of the earth in virtue *alone* of the properties of matter, while all the attendant facts in either case have been overridden by the spirit of hypothesis. Our unquestionable facts demonstrate the existence of causes when the earth underwent stratification, whether primary or secondary, that have had no proper analogies since the stratifications were completed, or the stratification would have still gone on; and we thus come to understand how the great mass of sedimentary rocks may have followed the operation of those causes in less than half a century. And as will have been seen, also, there is nothing in the aggregate depth of the sedimentary strata, when not piled artificially upon each other according to the method of Theoretical Geology, and nothing in the imbedded fossils, to contradict this conclusion.* The multiplication of testaceous animals is so rapid that a very few years would be an ample allowance of time for the early fossiliferous rocks; and in respect to the calcareous matter the attendant fossils denote, of course, that it was deposited with great rapidity. (See Appendix III.) Our various facts concur in showing that the calcareous deposits were a special circumstance growing out of a redundant solution of those substances at the period of the earth's consolidation. Limestone and its calcareous fossils also present far greater evidences of Design in the adaptation of means to the ends than

* Theoretical Geology distributes the various sedimentary strata into as many eras, and then proceeds to pile them upon each other, although some of them may be as remotely separated as Europe from America. The aggregate depth is then measured in miles, and the time required for the formation of all the strata is thus finally determined. The following is the *modus operandi* in geological science:

"When," says Sir CHARLES LYELL, "we have established the relative age of two formations in any given place, from *direct* superposition, or by *any other* evidence, a far more difficult task remains—*to trace the continuity* of the same formation, or, in other cases, to find means of referring detached groups of rocks to a contemporaneous origin. Such identifications of age are chiefly derivable from two sources—mineral character and organic contents; but the utmost skill and caution are required in the application of these tests, for scarcely any general rules can be laid down respecting either that do not admit of some important exceptions."—*Principles of Geology.* (See Chapter XIII., where we have had the foregoing subject under consideration.)

gold, silver, and iron, which have been so much admired in this respect by Theoretical Geology; since the former has vast relations to the exigencies of plants and animals, while the latter are limited alone to the conveniences of man. Precisely the same is also true, in respect to organic life, of all the other sedimentary strata; and least of all, therefore, can it be imagined that the Creator would have neglected, in His general plan of the earth and its inhabitants, the requisite means for the production of those great instrumentalities immediately after the organization of the earth was completed. And when we consider that the structure of the animals and plants whose exuviæ occur in the earliest fossiliferous rocks forms an indisputable proof that the earth was then as well fitted as now to its latest inhabitants, man included, how absurd the conclusion that the earth underwent a progressive preparation for an ascending series of creations till it should be rightly adjusted for the abode of man; and how greatly more inconsistent is it, with all our views of the Creator's designs, to suppose that He delivered over the earth to the meaningless occupation of animals and plants for a vast period of time—from the "reign of insects" to the "reign of mastodons"—when it is conceded by all that the object of the earth was to supply an abode for the human race, and the only object of animals and plants was to subserve the uses of man! (Chapters VII. and XIII.)

Theoretical Geology and ourselves are on common ground as to the early date of the sedimentary strata, but differ widely in respect to their causes and the rapidity with which they were formed. A principal cause of this difference, after the greater ones of their factitious thickness and their dependence upon agents now in operation, is the infrequency of exuviæ of the higher order of animals in the early strata. To this last objection it may be answered that their present scarcity in their native state enforces the belief that their aggregate number was small. But as great a reason exists in their perishable nature, especially under the influence of causes then in operation. And as to the contrast which Theoretical Geology makes of this particular circumstance with the profusion of testaceous exuviæ, it is at once disposed of by the marvellously rapid multiplication of the inferior aquatic animals; while in respect to any absence or

rarity of piscatory remains in the testaceous fossiliferous rocks it follows from the nature of these animals, who, like the birds, escape in their element when danger impends. The latter, indeed, "are usually wanting in deposits of all ages, even where fossil animals of the highest order occur in abundance."—(LYELL.) It should also be understood by the reader uninformed in geology that no fossiliferous strata, properly so called, are attributable to the general deluge, though that catastrophe probably gave rise, more or less, to a stratification of elevated land embracing fossil exuviæ—certainly in the coal-formations. (See Appendix III.)

It only remains now to be farther said, in respect to the sedimentary deposits, that the physical agents which have been in operation within the period of historical records shadow forth the desolation that might have speedily ensued upon causes which evidently bore an incalculable proportion to such as have been subsequently manifested, unless the general deluge form an exception. It was, however, at a far distant age in the calendar of modern times when the present physical agencies had entombed cities over an area of hundreds of square miles, as Babylon and Nineveh. But although Theoretical Geology allows the existence of causes during the earth's stratification, and the "carboniferous era," which have no parallel now, it forms its inductions very greatly from what it has witnessed in its daily course of observation; and hence the avidity with which it has pointed to the ravine below Niagara Falls in proof of their existence for at least ten thousand years—its great stand-point in the Western World. Here the conclusion has been founded upon what is observed to be in progress at the present day, and without any proper reference to the differences in the condition of the soil and rocks at different points of the gorge, and especially to the very contracted space at different parts of the ravine, and to the soft, friable condition of the sedimentary rock when the inundating waters departed from this region of country; nor to the important fact that the bed of the river is more rapidly disintegrated at distances above the falls than at their verge. Now such may have been the conditions in particular parts that a mile of the ravine may have formed in a century. A latitude of the period, therefore, which has elapsed since the General Deluge will appear to be a very ample amount of time to all who may

regard the subject in its manifest realities. HUGH MILLER makes a special point of this rarity, and is satisfied with the ten thousand years of Sir Charles Lyell.* He is even willing to allow a much shorter period: "Let us admit," he says, in his *Testimony of the Rocks*, "that the trunk through which the St. Lawrence now flows has been cut *in somewhat less than six thousand years.* But through what, let us ask, has it been cut? It has been cut through an ancient grave-yard of the upper Silurian system, charged with the peculiar fossils," &c.

Theoretical Geology, therefore, brings the beginning of the St. Lawrence and Niagara Falls to near the time of the General Deluge; and what other catastrophe within the compass of the last six thousand years than such a Déluge can have swept away the immense barriers of the inland sea in which the regions of the great lakes were submerged? The indisputable and conceded facts form one of the most conclusive monumental vestiges in proof of the occurrence of a general desolating flood at a recent date. And to the same effect are the vestiges of lakes which occur in all parts of the globe, especially in the vicinity of rivers, whose barriers were broken down apparently at the same time; and, as the denuded beds of the lakes attest, at a time not more distant than the sudden disappearance of the great barriers of the inland sea which resulted in the formation of the Niagara Cataract.

The opinion of Sir ISAAC NEWTON upon the origin of the earth will form an interesting conclusion of our subject. He entered into no philosophical analysis of the earth's composition, nor had science advanced sufficiently to enable him to penetrate the profound labyrinth; but his far-reaching mind, overleaping all secondary agencies, referred the organization of the earth, after creating its materials, as well as the complete formation of all things else, to continued and unqualified acts of Creative Power. Thus, in his *Optics*—

"It seems probable to me that God, in the beginning, formed matter in solid, massy, hard, impenetrable, movable particles, of such size and figures, and with such other properties, and in

* Sir Charles remarks, in his *Principles of Geology*, that "If the ratio of recession has never exceeded fifty yards in forty years, it must have required nearly ten thousand for the excavation of the whole ravine."

such proportions to space, as most conduced to the end for which He formed them. All material things seem to have been composed of the hard and solid particles above mentioned, variously associated in the first creation by the councils of the Intelligent Agent. For it became Him who created them to set them in order; and if He did so, it is *unphilosophical* to ask for any other origin of this world, or to pretend that it might rise out of chaos by the mere laws of nature; though, being once formed, it may continue by these laws."

APPENDIX II.

THE FLOOD.

[The substance of this Appendix appeared in my work on Theoretical Geology, 1856.]

We are assured by the Rev. Dr. Buckland, in his *Reliquiæ Diluvianæ* (1823), that "The discoveries of modern Geology, founded on the *accurate observation* of natural phenomena, *prove to a demonstration* that there has been a *universal* inundation of the Earth," and that "all these facts, whether considered *collectively or separately, present such a conformity of proofs* tending to establish the *universality* of a *recent* inundation of the Earth as no difficulties or objections that have hitherto arisen are in any way sufficient to overrule." "An agent thus gigantic appears to have operated UNIVERSALLY on the surface of our planet at the period of the Deluge; the spaces then laid bare by the sweeping away of the solid materials that had before filled them, are called Valleys of Denudation; and the effects we see produced by water in the minor cases I have just mentioned, by presenting us an example within tangible limits, prepare us to comprehend *the mighty and stupendous magnitude of those forces* by which whole strata were swept away, and valleys laid open, and gorges excavated in the more solid portions of the substance of the earth, bearing the same proportion to the overwhelming ocean by which they were produced that modern ravines on the sides of mountains bear to the torrents which, since the retreat of the Deluge, have created and continue to enlarge them."—Buckland's *Reliquiæ*, etc.

And thus the Baron Cuvier—"I am of opinion, with Deluc and Dolomieu, that if there be any circumstance *thoroughly established in Geology*, it is that the crust of our globe has been subjected to a great and sudden revolution [the Flood], *the epoch of which can not be dated much farther back than five or six thousand years ago.*"—Cuvier's *Theory of the Earth*, 1818. Of Buckland's

Reliquiæ he says: "Most carefully described by Prof. Buckland, under the name of *diluvium*, and exceedingly different from those other beds of rolled materials which are constantly deposited by torrents and rivers, and contain *only bones of the animals existing in the country*, and to which Buckland gives the name of *alluvium*. They now form, *in the eyes of all Geologists*, the *fullest proof* to the senses of that immense inundation which came last in the catastrophes of the earth." — *Discours sur les Revolutions de la Surface du Globe*, 1826.

It is also said by HUGH MILLER, in his "*Testimony of the Rocks*," in which he rejects the Flood, and laughs at the Ark as a "big box," that—

"The *tradition* of the Flood may be properly regarded as *universal*, seeing there is scarce any considerable race of men among which, in some of its forms, it is not to be found."

And the following somewhat obsolete Authorities:

"But as the days of Noe were, so shall also the coming of the Son of man be. For as in the days that were before the Flood, they were eating and drinking, marrying and giving in marriage, until the day that Noe entered into the ark, and knew not until the Flood came and took them all away; so shall also the coming of the Son of man be."—CHRIST, *in St. Matthew's Gospel.*

"By faith Noah, being warned of God of things not seen as yet, moved with fear, prepared an ark to the saving of his house, by which he condemned the world, and became heir of the righteousness which is by faith."—ST. PAUL, *in Hebrews.*

"By which also He went and preached unto the spirits in prison; which sometime were disobedient, when once the long-suffering of God waited in the days of Noah, while the ark was a preparing, wherein few, that is, eight souls, were saved by water."—*First Epistle of Peter.*

"And spared not the old world, but saved Noah, the eighth person, a preacher of righteousness, bringing in the Flood upon the world of the ungodly."—*Second Epistle of Peter.*

As it was a special object, in proving the creation of man as described in the Sacred Narrative, to show that he was endowed with a "Living Soul" and a Principle of Life (Chapters VII. and XIV.), so, also, I shall endeavor to show, as a concurring proof, that the Narrative of the Flood must have been equally a direct

Revelation, and that it must be received in the same literal sense. If this can be established, it disposes summarily of all speculations about "prehistoric man," and prehistoric animals as well. The doctrines of spontaneous generation, of the development of species from each other in an ascending series, of successive creations and extinctions, the whole typical system, &c., vanish before such an act of the Creator, independently of all my other facts and demonstrations. The inconsistency of all these assumptions will be abundantly manifest in the presence of such a special act of Providence. I would premise, also, that the usual mode of disposing of the Narrative of Creation, among those who are unwilling to reject it entirely, is equally applied to that of the Flood, as expressed of the latter by HUGH MILLER, who says that "The true question is, not whether Moses is to be believed in the matter, but whether or no we in reality understand Moses."!!—*Testimony of the Rocks.*

My remarks in regard to the *obvious* meaning of every statement in the Narrative of Creation are alike applicable to that of the Flood. No descriptive language can be more definite and intelligible, and, as I have endeavored to show, no sophistry can pervert their precise import, nor invalidate the collective statements of either Narrative as a perfectly consistent whole. This proof, however, of their Divine origin is much less cogent in respect to that of the Flood than of Creation, since the latter embraces a complexity of details and a stupendous philosophy.

The traditions relative to a universal Flood among all nations not only attest such an event, but they so far correspond with the Narrative as to render it certain that they had a common origin. It is obvious, indeed, that this tradition must have overspread the earth at an early day if the Noachian Flood had ever an existence, since Noah survived the event 350 years, and Shem 500 years—the former having lived to within 100 years of the birth of Abraham, and the latter was his contemporary 150 years. Now, did Noah and all his family conspire in fabricating a story of transcendent improbabilities, from which all the traditions have proceeded? Would not the whole condition of the earth, its renovated population, its animals, plants, &c., have rendered such an attempt at imposture ridiculous? Would not such an event, indeed, have appeared quite as improbable to

those early and widely scattered heathen nations as to the Christian people of our day, had not the information been imparted by survivors of the Flood, and even by the demonstrative proof which the Ark itself must have continued to supply long after its uses were at an end? And to all this let there be superadded the scene of desolation, the rarity of man and animals, and their gradual multiplication through the first two or three centuries. Reasoning from ourselves, it is readily seen that such a general belief in the Flood must have been long and forcibly impressed by the most direct and unequivocal testimony. There have existed, indeed, not only the universal traditions, oral and written, but others of a monumental nature, down to the present day.* Of these an example is supplied by HUMBOLDT among the Mexicans, who informs us that—

"Of the different nations who inhabit Mexico, *paintings*, representing the Deluge, are found among the Aztecks, the Miztecks, the Zapotecks, the Tlascaltecks, and the Mechoachans. The Noah, Xisuthrus, or Menon of these nations is called Coxcox, Teocipactli, or Tezpi. He saved himself and his wife Xochiquetzal in a bark, or, according to other traditions, on a raft; but according to the Mechoachans, he embarked in a spacious Acalli with his wife, his children, several animals, and grain, the preservation of which was important to mankind. When the Great Spirit, Tezcatlipoca, ordered the waters to withdraw, Tezpi sent out from his ship a vulture. This bird, which feeds on dead flesh, did not return, on account of the great number of carcasses with which the earth, recently dried up, was strewed. Tezpi sent out other birds, one of which, the humming-bird, alone returned, holding in its beak a branch covered with leaves. Tezpi, seeing that fresh verdure began to clothe the soil, quitted his bark near the mountain Colhuacan."—HUMBOLDT'S *Researches*.

In my work on *Theoretical Geology* (1856), I endeavored to prove the occurrence of the general Flood by the coal-formations, the universal distribution of boulders, &c., and that the Flood not only explains all the otherwise unaccountable problems attending the coal-fields, but that they would all have been

* FABER, in his *Origin of Pagan Idolatry*, has collected a great amount of all varieties of traditions of the Deluge; to which HARCOURT, in his large work on the *Doctrine of the Deluge* (1838), has made many and highly interesting additions.

a necessary consequence of such a cause. I have there, also, shown the numerous absurdities of the hypothesis of slow formation, and shall again consider the subject in Appendix III.

In respect to the boulders and other associate diluvial drift, I have also endeavored to show the errors of the "glacial theory," which has been invented as a substitute for the general Deluge, in explanation of the boulders or erratics and other superficial drift, which are manifestly owing to some universal cause in simultaneous operation. Those who entertain this doctrine are also advocates either of the nebular origin of the globe, or of its present molten interior, which is necessarily fatal to a theory that supposes the earth to have been invested with ice when its temperature was far more exalted than at present. And here we may stop for a moment to glance at other aspects of the "glacial theory," that Theoretical Geology shall not allege against us any suppression of its "facts." It has many speculations upon that frigid era, and has sometimes endeavored to evade the conclusion as to the universality of the ice by assuming its formation in northern regions, and thence "either floating like icebergs," according to Professor Agassiz, "or, as there is still more reason to believe, moving along the ground like the glaciers of the present day, deposited the numerous detached fragments brought from distant localities."—*Principles of Zoology.* But this will explain only the drift that is deposited at the base of mountains, taking our Author's parallel example. The boulders and other associate drift may be said to be almost everywhere, and everywhere detached from the tops of high mountains. To have effected such results there must have been a universal and deep incrustation of the earth with ice; and if Theoretical Geology disavow this, it must then abandon its "glacial theory." Or, if Geology be interrogated as to the manner in which, according to its alternative, "the icebergs" got out of the ocean upon land, or as to the abundance required by the diluvial drift, or how they withstood the geological heat in travelling the whole face of the earth, or how glided over its mountainous surface, there probably would be some difficulty in rendering intelligible answers. But taking that most plausible aspect of the hypothesis which supposes that the ice, after having gathered the boulders and other material from the dry land, became detached and rolled

away upon the expanse of waters, where the boulders and other drift were deposited upon the rising bottom of the ocean; why, then, are not the boulders sometimes, at least, incrusted with marine shells, and often covered with a sedimentary deposit from the ocean? Why not always reposing upon oceanic formations; while, on the contrary, not only every variety of rock is their resting-place, but all over the earth they lie superficially upon alluvial soil, or are piled into hills along with other diluvial drift?

But the distinguished advocate of the glacial theory just quoted has recently supplied some statements which necessarily suppose the entire earth to have been simultaneously invested with a coating of ice. In his late exploration of the Amazon he found in the drift satisfactory indications that its valley was once filled with glaciers, and that they had overspread the elevated regions of Brazil. This glacial condition must, therefore, have been continuous from the tropics to the arctic regions. But our Author, who has the "glacial theory" in his special charge, has still more recently affirmed the universality of the earth's incrustation with ice. In a published letter (1870) to William Bradford, he says that—

"The photographic illustrations you have brought from your late expedition to Greenland have, in my opinion, a high educational value." "For me personally they have a special interest, as showing graphically *the remnant of that great* ICE-SHEET *once spreading over the whole United States*, now shrunken within the limits of the North Pole."

But the hypothesis, which is so clearly contradicted by the existing condition of the earth in respect to temperature, and its various zones as they relate to the Sun, is even more so by the undisturbed condition of animal and vegetable life. Such an universal "ice-sheet" would, of course, have been of sufficient duration to have completely extinguished all the land animals, at least, and all vegetation; or, had it been only partial and at all commensurate with the boulders and other drift, the attendant universal reduction of temperature would have so blighted vegetation as to have been fatal to all land animals; while, on the contrary, there has been no unusual disturbance among the animal tribes. Very manifestly the "Glacial Theory" has not been

sufficiently mindful of the exigencies of vegetable and animal life in having thus excluded atmospheric air, frozen up the surface of the earth, cut off all nourishment, &c.; nor is there any possibility of evading these conclusions. But such difficulties are no obstacle to Theoretical Geology.

There was a time, prior to the Rev. Dr. BUCKLAND'S day, when Theoretical Geology had not entirely discarded the General Deluge; and the Philosopher of Oxford prepared the way for its final rejection by pronouncing it, with his own *Reliquiæ Diluvianæ* before him, "a tranquil inundation." That work, however, will remain a much nobler monument to the memory of the most efficient originator of recent theoretical geology than the Bridgewater Treatise on *Geology and Mineralogy*, in which he abandons the former in behalf of the latter. To the *Reliquiæ* we may refer for an ample amount of proof that the boulders and other superficial drift which overspread the earth were due to a general flood, which, in its recession from the north-west, swept over the summits of mountains, and dislodged fragments of rocks of thousands of tons. Our Author's true opinion of the violent and devastating nature of the Flood has been quoted at the beginning of this Appendix; and the testimony of our own senses assures us that his conclusions are not exaggerated. We know it from the universality of huge boulders and other drift, often wafted over immense distances, and always in one direction, always, or nearly so, on the southerly or easterly face of mountains, along with a corresponding direction of the so-called "scratches," or furrows, produced by collisions with superficial strata of rocks. What, also, denotes a recent distribution of the boulders is the general fact that they either lie upon the surface of the ground, or are piled into hills with other drift.

It will be impossible, of course, to present the details of this copious subject; but I shall recur to it again in the Appendix on the coal-formations, which, in themselves, supply an ample proof of a general deluge. In my work on *Theoretical Geology* I have presented several examples in illustration of the event, particularly as they occur in the State of Vermont, which is one of the best places for observation. Here the granite boulders, generally of large dimensions, are distributed over the State upon the easterly side of the Green Mountains, from the summits of

which they have been detached. The surface through a large extent of country is immediately underlaid by clay-slate, or which often forms the surface, of a very early date, upon which the boulders repose, or have been accumulated into hills along with gravel, &c. This slate being often denuded, supplies very ample opportunities for observing the scratches, which constantly run in a south-easterly direction; and it frequently happens that the boulder by which a furrow was made has found its resting-place in the immediate vicinity. Two examples may now be stated of what is common throughout the State of Vermont on the easterly side of the Green Mountains, but not on the westerly; and one of our examples may be readily witnessed by a visitor to Montpelier, the capital of the State. This town is situated in the valley of Onion River, at a distance of some fifteen miles from the mountains. On the southern side of the village, in the direction of Berlin, the country rises more than three hundred feet within the distance of two miles and a half, and the side of the hill, which consists of clay-slate, is everywhere strewed with granite boulders varying from one to more yards in diameter, and scarcely worn at their edges; which shows that it would have been as much of an "up-hill work" for the "glacial theory" as Homer's mythological conceit of tugging at the stone. These boulders are conspicuous from the road-side, and have been transported from a distance of at least a dozen or fifteen miles. At two miles and a half from Montpelier, upon the hill I have mentioned as rising to an elevation of three hundred feet or more, there lay, a few years ago, upon the denuded surface of clay-slate, within a few rods of the road, one of those granite boulders of immense size, concealed from the observation of the passenger by an intervening mound. My attention was attracted to it by a pile of granite blocks which had been quarried out for building purposes, and placed within view of the road. I found the remaining portion of the boulder lying at the foot of a low hill down which it had rolled. This hill rose gradually to about forty feet, upon the summit of which the clay-slate had been thrown up perpendicularly, so as to form a wall of some four feet in height and two to three feet in thickness, and extending along a fourth or a third of a mile in an unbroken line, excepting at a point in a northerly direction from the boulder, where was a gap

down to the base of the mural range corresponding with the dimensions of the boulder; and in a line continued northerly is a bald granite mountain from which the boulder was evidently dislodged, and which, striking the upright barrier, had cut its way, rolled down the declivity, and *imbedded itself in the clay-slate* to the depth of more than a foot, as shown at the portion which had been quarried out.

Another example, and of great interest, on account of its well defined character and its easy access, may be seen upon an upland plain less than two miles north of West Randolph, in the same State, about twenty miles south of Montpelier. Here the clay-slate is very superficial, and denuded in many places. In the midst of this plain stands a bald granite mountain, of conical shape, which has been thrown up to the height of some six or seven hundred feet, with a diameter at its base of about a third of a mile. A vast pile of huge boulders lies at the foot, over several rods, upon the south side, but they become gradually dispersed upon the plain in the shape of a fan, spreading wider and wider, till they are to be seen of the same ponderous dimensions, expanded over a broad extent of the distant slope which rises south-easterly of the village. But this is not the only interesting part of this locality, for there is not a boulder to be seen in any other direction from the mountain. And now, what will "the glacial theory" respond to this phenomenon, where boulders are seen in one direction only, spreading out like a fan, and taking the same course as witnessed in all mountainous countries? This is only an example of what is presented by the whole range of the Green Mountains; and its overwhelming testimony of the flood and of its resistless force is too obvious for comment.

Sir CHARLES LYELL, in speaking of the supposed "glacial period in North America" in his *Antiquity of Man* (1863), renders an account of erratic blocks, or boulders, as witnessed by himself "in Berkshire, Massachusetts, and those of the adjoining parts of New York, about one hundred and thirty miles inland from the Atlantic coast," which corresponds with my own experience over large regions of the Northern States:

"Although smooth and rounded on their tops," he says, "they are angular on their lower parts, where their outline has been derived from the natural joints of the rocks. *Had these blocks*

been conveyed by glaciers they would have radiated in *all directions from a centre*, whereas *not one* even of the smaller ones is found to the *westward* [of a particular ridge], though a very slight force would have made them roll down to the base of that ridge, which is very steep in its western declivity. It is clear, therefore, that the *propelling power*, whatever it may have been, *acted exclusively in a south-easterly direction.* I observed one of the green blocks, twenty-four feet in length, poised upon another about nineteen feet in length. The largest of all is about ninety feet in diameter, and nearly three hundred feet in circumference. We counted at some points between forty and fifty blocks visible at once, the smallest of them larger than a camel."

Such, as it respects the south-easterly direction of the erratics, I believe to be true of all the mountainous regions of the Northern Atlantic States—certainly as far as my observations have extended over large regions. Although Sir Charles refers rather obscurely to the "propelling power" which dislodged and scattered the boulders, and considers "*the hypothesis of the glaciers as out of the question*," as he says in another place, he nevertheless remarks that—"I conceive that the erratics were conveyed to the places they now occupy by coast ice, when the country was submerged beneath the waters of a sea cooled by icebergs coming annually from arctic regions." But why, then, were none of the very numerous erratics deposited on the westerly side of the ridge, especially since the ridge is supposed to have been submerged? The same objection obviously applies as much to the hypothesis of floating ice as to that of the glaciers. Nor can the phenomenon be isolated, and interpreted apart from thousands of others of the same nature which overspread the Northern States.

A well-defined example of the foregoing nature, and one of ready observation, occurs at the trap-formation known as the Palisades, which traverse the western shore of the Hudson River (see Appendix I.), although an attempt has been made to appropriate even the boulders from this locality to the glacial theory. But an attentive observer, not in the interest of Theoretical Geology, will quickly perceive that every attendant circumstance is distinctly opposed to the assumption, and equally indicative of a desolating flood. It is also here worthy of remark, as bearing

upon the "glacial theory," that this region of trap has been thrown up through an aqueous deposit of a disintegrated granitic rock of ten to twenty feet in thickness. These trap Palisades rise to the height of 300 to 500 feet, and generally present a perpendicular face upon the river side. The boulders which have been detached from them are often more than a dozen feet in length and breadth, and are distributed in great profusion over the island of New York, and occupy many miles of the southern portion of Long Island as far out as the ocean. The greatest abundance, however, is to be seen in a south-easterly direction from the gaps in the Palisades. Here the flood has cut its way through, and swept all before it; and whoever will pursue a south-easterly course from the gaps will meet with demonstrations that will silence any doubt as to the nature of the catastrophe upon which they depended. Or, if he take a westerly course, the absence of similar boulders upon that side will add more strongly to his conviction. He will also find an equally conclusive proof of the absurdity of applying the "glacial theory" to this wreck of the Palisades in the frequency with which immense boulders have been piled into hills varying from fifty to more than a hundred feet in height, along with huge granite boulders from very distant localities, and a great variety of rubbish, of which graywacke, especially, often bears the exuviæ of testaceous animals. These remarkable hills, large, and of a conical form, were common on the easterly side of New York, and I made them many visits while they were undergoing removal. I then saw the boulders (as they were doubtless seen by many geologists), more than fifty feet above the base of the hills, of variable sizes to a dozen feet in all their dimensions, side by side of, above and below, granite boulders of equal dimensions, but once separated by an immense distance, and graywacke with "medals" in perfect preservation. But as these hills, which supplied so good an opportunity for observation, have disappeared, the same thing may be seen over all the southerly part of Long Island. Or, whoever will cast his eye upon the denuded hills as he passes along the river railroad that conducts him from New York to Albany, will find them studded with trap boulders, particularly in places opposite to the fissures in the Palisades. We need not say how all this is demonstrative of the Deluge and of the reck-

lessness of the "glacial theory;" nor how it should impress a conviction of the desolating power with which the waters are graphically said to have "prevailed exceedingly upon the earth."

The foregoing considerations, and what remains to be stated more extensively of a similar nature when I come to the coal-formations (Appendix III.), reveal to us the cause of many other analogous phenomena which have contributed to the multitude of hypotheses in Theoretical Geology. Among the most important of these are the ravine below the Falls of Niagara, and the removal of the barrier at the outlet of Lake Ontario and at other places, by which an inland sea was pent up in the northerly section of North America, and which were under consideration in Appendix I. We then saw that Theoretical Geology assigns to these occurrences a date so recent as to bring them nearly within the Scriptural period of the Noachian Flood. No one will deny that such a debacle as a general Deluge, more than any one of Theoretical Geology, was calculated to sweep away those barriers, and otherwise contribute towards the excavation below the Falls of Niagara; nor does Theoretical Geology assign any of its debacles to a period as recent as it grants to the ravine of Niagara Falls and the trunk of the St. Lawrence (p. 601). And precisely in the same manner do we arrive at an explanation of the vacated lakes in all parts of the globe, from which the waters generally departed simultaneously with the inland sea of which the St. Lawrence formed one of the outlets.

Corresponding, also, with what I shall say in Appendix III. of the testimonials supplied by the coal-fields, is the extensive distribution, in high northern latitudes, of the bones of animals that inhabited either tropical or temperate climates, of which Sir CHARLES LYELL has the following example, and which may be introduced with the remark that it is unaccountable that the fact and his speculations upon it, especially in connection with the boulders and other diluvial drift, had not suggested to him the probabilities, at least, of a general flood. Thus Sir Charles—

"The bones of the great fossil Mammoth are *very widely spread over Europe and North America*, but are nowhere *in such profusion as in Siberia, particularly near the shore of the frozen ocean.* Are we, then, to conclude that this animal *preferred a polar climate?*

IF SO, BY WHAT FOOD WAS IT SUSTAINED, AND WHY DOES IT NOT STILL SURVIVE NEAR THE ARCTIC CIRCLE?" !!—*Principles of Geology.*

And more than that: Sir Charles neglected to speak, in the foregoing connection, of the celebrated Elephant and Rhinoceros which were found in that same arctic circle, and where no "food" exists, in a state of perfect preservation; one being frozen in the ice and the other in the sand, ever since they were wafted there by the Flood. This contradicts Sir Charles's hypothesis, to suit the occasion, that there may have been in that region, "*at no very remote period* in the earth's history, a temperate climate, sufficiently mild to afford food for *large herds of Elephants* and Rhinoceroses." !! The perfect preservation of the animals proves that they must have perished where food was supplied; and it shows, also, that when the animals were deposited there the temperature was the same as at the present day, or decomposition would have taken place immediately. It should be considered, also, that the bones of the Mastodon are found lying superficially in all the climates of the globe—in high southern latitudes of North America as well as "near the shores of the frozen ocean;" and that in Virginia the stomach of one was found undecomposed and filled with species of plants then growing around it. By what natural process can be explained the sudden extinction of this animal at a time when it existed in immense numbers, and of other mammalia whose bones are equally distributed over vast regions of the earth, and which disappeared at the same late geological era? No other answer can be rendered but that of a universal flood, whether they perished in the regions where their exuviæ are found, or if transported about from some particular zone of the earth. And here it is worthy of remark that some species of animals, especially the larger, probably became extinct before they had multiplied after the Flood, since immediately after that event they were equally subject as before to destructive agencies. And if we consider that only two of each species, with a few exceptions, were preserved in the Ark, and how barren must have been the earth, especially the low grounds, we come at once to understand why the remains of so many extinct species refer themselves to the era of the Deluge. The Virginia specimen of an undecomposed stomach of the Mas-

todon, in connection with the wide distribution of the bones of this animal, is an exemplification of our remark, and supplies a critical proof of the Mosaic Narrative.

Let us here, also, refer again, as a cogent proof of the Flood, to the monumental records of the human race. I have said (Chapter XII.) that we can trace them no farther back than Babylon and Nineveh; and here we find a high advance in the arts of civilization. But this denotes a long antecedent civilization, a long line of other cities of which there is no other indication than such as is supplied by Revelation. Where are the vestiges? Where to be found the traces of man's progress in knowledge prior to the Assyrian and Egyptian era, excepting in that which was imparted by Noah and his immediate descendants? By digging down we may possibly find them, as we have the coal-fields. But the disappearance of all traces of civilized humanity prior to the foregoing cities can be interpreted only by a general flood; and it must be taken, therefore, as one of the indubitable proofs of such a debacle. The era, also, of those ancient cities corresponds with the estimated era of the Flood, and thus increases the force of the proof. (See Chapter XII.)

There are many other details of the foregoing nature which have either been already considered, or will be reserved for a subsequent part of this Appendix and for that on the *coal-formations;* and I shall now proceed to consider the capacity of the Ark, upon which I might rest, essentially, the proof of the Inspiration of the Narrative of the Flood, and of its universality. I shall show that the capacity of the Ark was even more than sufficient for all the land animals known at present; while it would be preposterous to suppose that Moses or any one of his day would have invented such a structure for the few animals then known. As, however, it has become a settled opinion that the vessel was not sufficiently capacious to meet the requirements of the Narrative, I must necessarily consider the subject in minute detail.

Different estimates have been made of the Jewish cubit in its application to the dimensions of the Ark. Dr. ARBUTHNOT, in his elaborate work on *Coins, Weights,* and *Measures,* decides it to be equal to 21.888 English inches. This is also Dr. KITTO'S estimate, and is adopted by HUGH MILLER in his *Testimony of the*

Rocks. It is safe, therefore, to follow Miller's opinion upon this question, since he had no disposition to exaggerate the dimensions of the Ark; and for a like reason I shall adopt his estimate as to the number of animals, &c. He introduces the subject in his characteristic manner, thus:

"The form and dimensions of Noah's Ark are sufficiently given in the Sacred Record. It appears to have been a great *oblong box*, somewhat like a *wooden granary*, three stories high, and furnished with a roof apparently of the ordinary angular shape, and a somewhat broader ridge than common;* and it measured three hundred cubits in length, fifty cubits in breadth, and thirty cubits in height"—and much more in a similar style, both as to the Narrative of the Flood and of Creation, and which has had its intended effect upon those to whom it was addressed.

He then allows for the cubit twenty-one inches and nearly nine lines; and "let us agree," he says, "with Dr. Kitto that the Ark was 547 feet in length by 91 feet in breadth," and about 54 feet in height, with three stories. Thus provided, our Author goes on to say:

"Measures *so definite* were effectual in setting the arithmeticians at work in all ages of the Church, in order to determine whether all the animals in the world by sevens and by pairs, with food sufficient to serve them for a twelvemonth, could have been accommodated in the given space. It was a sort of stock problem, that required, it was thought, no very little attainments to solve. Eighty years have not yet passed since kind old SAMUEL JOHNSON, in writing to little Miss Thrale a nice little letter, recommending her to be a good girl and to mind her arithmetic, advised her to try the Ark problem." At the time of this crushing repartee, he allows that there were "A few lingering Theologians, some of them very intelligent men, who continue to regard *the Ark as quite big enough* for all." Notwithstanding, however, these discouragements, I shall endeavor to "try the problem."

Miller then adopts the latest estimate of the air-breathing vertebrates as supplied by "the admirable *Physical Atlas of Johnston*, 1856." They then amounted to 8596 Species, exclusive of the

* The general estimate is that the roof of the Ark was raised in the middle only 21 inches.

cetacea and seals.* Besides these an allowance must be made for a certain proportion of land insects, and for land animals that may have been discovered since 1856. But for all these we shall find an abundance of room.

Taking next the foregoing dimensions of the Ark, and multiplying the length by thrice the breadth (for the three stories), we shall have what is equivalent to a single deck of 547 feet in length and 273 feet in breadth, or 149,331 square feet—being nearly equal to three and a half English acres. Such are the usual premises; although estimates are generally made of the solid contents and the amount of tonnage. But the estimates for the animals, food, &c., are always limited to the area of the *three floors*, without reference to the actual capacity of the Ark—regarding the floors as representing the tonnage. The calculation, however, thus predicated of the area of the three floors will yield only 149,331 square feet. But it will be found sufficiently ample for all the required purposes; and therefore upon this basis my calculation will be first made. The allowance of space to the animals is much greater than in our menageries. But it supposes that the Creator made no excessive provision of room; none for promenades, on such an emergency. Nevertheless, for the purpose of the most comfortable accommodations, I shall ultimately show that every land-breathing animal known at present was allotted at least twice the space allowed by our first estimate. So far as this I agree with Hugh Miller, that "*We in reality have not understood Moses.*" We have looked for too much detail in the Narratives both of the Flood and of Creation,

* The following is Johnston's classification:

	Species.
Quadrumana	170
Marsupiala	123
Edentata	28
Pachydermata	39
Terrestrial Carnivora	514
Rodentia	604
Ruminantia	180
Birds	6266
Reptiles	657
Turtles 8, Sea-Snakes 7	15
Total	8596

which were intended to be of a general and comprehensive nature, and obvious inferences left to the common understanding of mankind. Moreover, besides the alleged want of capacity in the Ark, the Flood is farther discredited by rejecting the indispensable miracles, and by a supposed deficiency of water, &c. I shall therefore show, before dismissing the subject, that all the reputed miracles were in the highest degree probable, and that there was naturally an abundance of water.

Proceeding, then, in the first place, with our lowest estimate of 149,331 square feet (the area of the three floors), let us adopt as a standard measure the space allowed in livery-stables for a horse. This is generally 4 feet by 8, or 32 square feet. But let us say, instead, 5 feet by 8, or 40 square feet, and endeavor to supply every animal, according to its size, with a corresponding amount of room. Should it be thought, however, at the close of my first estimate that a sufficient allowance has not been made, there will be ample room remaining for any supposed deficiency.

Adopting next Miller's large estimate of 166 species of *clean* beasts that must have been taken into the Ark by *sevens*, and which, multiplied by seven (that is, three couples for breed, and one for sacrifice), will amount to 1162 individuals; besides a few *clean* fowl not enumerated, but for which, and for any increase of the numbers of *clean* beasts since 1856, ample space will be provided. These 166 species consist of 20 species of Ox, or 140 individuals; 27 of Sheep, or 189 individuals; 20 of Goats, or 140 individuals; 51 of Deer, or 357 individuals; and 48 Antelopes, or 336 individuals. Total number of individuals, 1162. To each of the 140 oxen we will assign, on an average, a stall of 5 feet by 8, making a total of 5600 square feet; to the 189 sheep a pen of 1280 square feet; to the 140 goats a pen of 920 square feet; to the 357 deer a pen of 4760 square feet; and to the 336 antelopes a pen of 2240 square feet. The space thus allowed amounts to 14,800 square feet.

Let us take next the largest beasts, the Pachydermata, 39, and others down to the size of the African Lion, and allow for the whole the very improbable number of four hundred species. This, multiplied by two, makes 800 more individuals; and let us make an average allowance of 60 square feet for each animal, amounting to 48,000 square feet. This, added to the preceding

consumption of space, will leave 86,531 of the original 149,331 square feet, or area of the three floors.

We have now remaining 8030 species, or 16,060 individuals, less than the size of the African lion down to that of the very numerous species of the humming-bird, to be provided for. It now becomes more difficult to say how much space should be allowed for those smaller animals; of which 12,532 individuals are birds, 1208 rodentia, and a large number of small carnivora. But allowing 20 square feet to every eight of the remaining 16,060 individuals, 40,000 square feet will meet the demand. There will then remain of the area of the floors 46,531 square feet, which exceeds an English acre by nearly 3000 square feet; and there is nothing to occupy this immense space but Noah's family, a year's supply of food, and any number of insects whose eggs were not preserved in the mud. The food, however, should be deducted from this and packed in the hold of the vessel, according to the opinion of Josephus and Philo; and there will then remain to Noah's family an area of an acre and 3000 square feet, admitting a dozen shelves, each of nearly a similar area, or equivalent to an area of a dozen acres, for the insects or any other conceivable purpose.

The excess of room has resulted from adopting such a plan of accommodation as is devised by man for the disposal of animals that are deprived of their liberty, as in stables, menageries, and vessels, and not such as was intended by the Creator. A large proportion, therefore, of our remaining 46,531 square feet may be added to our estimate of the requisite dimensions of the stalls, pens, and cages. As to exercise, an ample amount would have been supplied by the motion of the vessel.

But a word more about the Insects. When I come to the demonstration which the coal-formations afford of the occurrence of a universal flood, it will appear that this debacle may have covered "all the high hills under the whole heaven," and yet that the average depth of water was only "fifteen cubits," or about twenty-seven feet; and although human reason, with its present knowledge, must deduce this as a certain consequence from the surrounding facts, it would have appeared absurd to an uninspired writer of the time of Moses that a depth of "fifteen cubits" of water would have been sufficient to cover all the high

hills, and I may therefore appropriate this consideration as an exquisite internal proof of the Divine authority of the Narrative; especially as the statement is regarded by others as wanting in credibility, and not only so, but that the oceans would not supply the requisite quantity of water. And now as to the Insects. According to our premises, then, the greatest depth would have been upon the least elevated parts, and the most superficial upon mountainous regions; while, as will be seen in Appendix III., from the nature of the causes which carried the waters over the high hills, other elevations of a few hundred feet, and remote from the mountains, were, like the higher mountains, only transiently and superficially submerged. The Insects, therefore, or at least their eggs, which are very tenacious of life, would have been very safe in the mud at elevations of a few hundred feet. Nor does this construction interfere in the least with the comprehensive statements in the Narrative, since they apply only to animals that would have *completely* perished in the catastrophe. But this is not said to evade any difficulty about assembling the insects, or to exclude them from the Ark, but only to afford an alternative to the incredulous in Divine Power or in the unity and consistency of His plans. The probability is that the perpetuity of insect life was generally left to eggs imbedded in the ground, as that of vegetation was to the seeds of plants.

The foregoing calculation of the capacity of the Ark has been made simply for the purpose of showing that the hitherto estimated area of three floors would have been sufficient for all the purposes of the Ark, and more commodious than the usual provision which is made by man in his analogous restraints upon animals. But the Creator was more bountiful than has been surmised, as I shall now proceed to show. In the first place, the number of floors in the Ark has been most mistakenly limited to three; and this is more remarkable, considering that many of those who have "tried the problem of the Ark" have estimated its solid contents and tonnage as well as the area of its floors. The tonnage, indeed, has been sometimes much overrated. It is stated, for example, in REES'S *Cyclopædia*, and in BROWN'S *Dictionary of the Bible*, and by other authorities, that Dr. ARBUTHNOT makes the capacity of the Ark equal to 81,062 tons, allowing 21,888 inches to the Jewish cubit; which is an excess of

about 12,700 tons. But I can not find any estimate of the capacity of the Ark in Arbuthnot's writings. The error appears to belong to another quarter.

According to our standard measure of the Jewish cubit, the precise length of the Ark was 547.2 English feet; breadth, 91.2 feet; height, 54.72 feet. These dimensions yield 2,730,781.9008 solid feet, and a fraction over 68,269 tons of 40 cubic feet. The Ark was, therefore, more than three times the capacity of that wonder of the modern world, the Great Eastern, whose tonnage is 22,000. It is inexplicable, therefore, why a vessel of such marvellous proportions as the Ark should not have suggested the certainty that an enormous amount of space would have been wasted with three floors only—such a waste as rarely obtains in sumptuous private dwelling-houses of three stories. The limitation of the accommodations of the Ark to three floors, notwithstanding their sufficiency, has been the source of all the perplexities that have annoyed the multitude who have "tried the problem." They have looked with wonder at the stupendous dimensions; but three floors were so out of proportion that a belief appears to have obtained universally, especially through the instrumentality of Theoretical Geology, that the Ark was not sufficiently capacious for its avowed purposes. But its capacity remains good for 68,269 tons.

Although we read of only three stories, there was no limitation as to the number of floors; but there was the summary instruction—"Rooms shalt thou make in the Ark." The details were left to Noah's skill and common sense, and he was allowed more than a hundred years for the completion of the vessel; and as this great length of time corresponds with the specified dimensions, and with the fulfillment of other requirements, it must be taken as corroborating proof of the accuracy of all the statements, and as one of the numerous internal proofs of the Inspiration of the Narrative. All the instructions as to the building of the Ark are comprehended in about sixty words, and they convey all the information that is necessary for a clear understanding of the capacity and conveniences of the vessel. Any unnecessary explanation in the Narrative would have been incompatible with a Divine Revelation. Doubtless, however, other instructions than those recorded were given to Noah. But enough has been re-

vealed for our ample information. This absence, I say, of all unnecessary details in compact Narratives which embrace a complete general outline of events that clearly suggest the details involved, is one of the many internal proofs of the Inspiration of the Narratives of the Flood and of Creation. It is abundantly obvious that a limitation to three floors in a building of fifty-four feet in height, leaving a greatly excessive space between the floors, was never intended by the Projector of the Ark. There were but a very few animals that required an elevation of even twelve feet, and a vast proportion not more than from one to four feet. But if we simply double the hitherto estimated number of floors, there will be a luxurious provision of room for all the animals, for Noah's family, and for the requisite food. The capacity of the Ark, as we have seen, was more than three times that of the Great Eastern. It was equal to thirty-four frigates of 2000 tons each, capable of carrying 40,000 men, 3000 pieces of cannon, and stores and provisions for six months' consumption. Now, all the animals saved in the Ark amounted to only about 18,000 individuals, down to the size of humming-birds and mice; which, when deducted from the 40,000 men who could have been as well accommodated in the Ark, along with 3000 cannon and six months' provisions, we have remaining sufficient room for 22,000 more, if we estimate every animal of all the 18,000 individuals, humming-birds, mice, and all, at the average size of a man. What says skepticism to these figures?

Such, then, was the capacity of the Ark, whatever may have been the number of floors—a vessel of 68,269 tons. The measures are precise, the objects clearly and circumstantially defined, and they enforce the certainty that the writer intended to be "understood" as expressing, throughout the Narrative, not only a universal flood but a universal preservation of land animals. That, however, was not the conception of an uninspired writer. None but an Omniscient Being could have known any thing of the necessary dimensions of the vessel. All others would have adapted its size to the supposed number of animals to be preserved; and for this purpose "an oblong box" of a thousand tons would have been regarded as more than adequate.

Since, therefore, an uninspired writer could have known nothing of the requirements of the case, it is absurd to imagine that

he would have been guilty of the stupid folly of either providing such a vessel (probably more than three hundred times greater than had ever floated in the days of Moses), or of destroying his own credibility by apparently so gross and unmeaning a falsehood, and least of all one so consistent, and able, and devout as the writer of the Narrative. The number of land animals known at present is probably sixty times greater than known to Moses; and, were the Narrative written with our present knowledge, a corresponding exaggeration would present us with a vessel of more than four millions of tons. And while, therefore, any thing like the admitted "definite measures" of the Ark are allowed to remain unquestioned, they will form a standard of interpretation for the whole Narrative which no "modern science" can invalidate, and which will defy the most ingenious sophistry. Indeed, it is impossible to overrate the importance of this internal proof not only of the Flood but of its universality. And, although the occurrence of a general flood is demonstrated by the coal-formations, and also by the boulders and other associated drift, and by a great amount of internal proof in the Narrative, as I have endeavored to show, we might confidently leave the truthfulness of all the statements to the internal evidence supplied by the dimensions of the Ark. And however much this Narrative has shared the obloquy of the Narrative of Creation, this one overpowering internal proof will rise up with a coming generation in no flattering contrast with the present, either as it respects the wonderful fact, or the refusal to recognize the catastrophe as an act of the Divine Being. In the presence of such a structure as the Ark, with all its objects specifically assigned, we may even look with astonishment upon the conclusions of those enlightened men who, through a long period of time, have been disposed to compromise the Narrative by conceding a local flood in a limited part of Asia.

And now a word as to the window, which was, doubtless, one of some special device; and therefore nothing more is revealed in regard to an ample provision for what is so obviously necessary as light. And so as to the exigencies for air, ventilation, &c., about which nothing is said. A suppression of all such details goes to the proof of the Inspiration of the Narrative; since, if it were a device of man, no such opportunities to impeach its

credibility would have been afforded; while, on the contrary, it is precisely characteristic of the ways of the Creator in relation to man. There is even much more of detail about the structure of the Ark than about the organization of the Earth, while in the latter connection we are simply told that He made the Sun and Moon, and the Stars also, and without any explanation of the delay of their introduction to our notice until the fourth Day of Creation. (See Chapter XIV., and Appendix I.)

I shall now undertake to show how it may be settled that the Flood was, in all its greatest details, of a miraculous nature; as this is strenuously opposed by Theoretical Geology, and by all forms of the "New Philosophy," as the grand expedient for ejecting the Narrative from the Bible. A representative Authority, the Rev. Dr. HITCHCOCK, supplies the following summary statement upon the question:

"It is well known," he says, "that from the earliest times writers have indulged in speculations on the natural causes of this event (the Flood); while to many such an inquiry seems almost sacrilegious; since they suppose the Deluge to have been strictly miraculous. Had the Sacred Writer distinctly informed us that such was the fact, all philosophical reasoning concerning that event would have been presumptuous and useless. But since *the Bible is silent upon this point*, and since we know it to be a general principle of God's government *not to superadd to natural agencies a miraculous energy* where *the former is sufficient* to accomplish His purposes, we are surely at liberty to inquire whether any forces exist in nature sufficient, by their unaided operation, to produce such a catastrophe." Nevertheless, he thinks that "a perusal of the Scriptural Narrative of the Flood is apt to leave the impression on the mind that *it was miraculous*, and that, if so, we should not surmise *the agency of second causes*." It is also his opinion that, if there was such a catastrophe as the Flood, the preservation was limited to "man and the necessary domestic animals," and that "a *new creation* of animals and plants may have taken place subsequent to the Deluge;" notwithstanding a general preservation in the Ark would have saved the necessity of "superadding to natural agencies a miraculous energy;" but perhaps, also, because the Ark had a capacity of only a little more than 68,000 tons.—*Am. Bib. Recorder*, Jan., 1838.

Whoever rejects the miraculous nature of the Flood, so far as denoted by its manifest exigencies, must at once abandon all faith in the Sacred Narrative; for it is evident that the event could not have occurred without Divine interposition, however much natural causes may have contributed their effects. The whole import of the Narrative denotes the superintending care of the Creator, and some of the statements convey that assurance. It is said, for example, that "The Lord shut him in;" that "God remembered Noah and every living thing, and all the cattle that were with him in the Ark"—the obvious meaning of which is that the Ark and its inmates were special objects of Divine care and protection. The miraculous agency is also declared in the most direct manner in the statements—"Behold, I, EVEN I, DO BRING A FLOOD OF WATERS UPON THE EARTH," &c.—"And the Lord said, I WILL DESTROY man," &c.—"Behold, I WILL DESTROY them with the earth."—"For yet seven days, and I WILL CAUSE IT TO RAIN upon the earth forty days and forty nights; and every living substance that I have made WILL I DESTROY from off the face of the earth."—"The fountains of the deep and the windows of heaven WERE STOPPED, and the rain from heaven WAS RESTRAINED."—"And GOD MADE A WIND to pass over the earth, and the waters assuaged."—"I will establish MY covenant, &c., neither shall there any more be a flood to destroy the earth." According, also, to Biblical critics the Hebrew word for Flood "is limited in its application to the General Deluge, not being employed in reference to any other kind of inundation."

To settle this question still farther, let us assume what is unnecessary, but perfectly proper to surmise, that the Creator was directly instrumental in multiplying the food provided by Noah. The objection to such a miracle must vanish before all others that were more or less involved in the Flood; and should it be allowed to obtain, upon principle, in this instance, it would dissipate all objections to other more obvious miracles. Moreover, this being shown to be consistent with other undisputed, miraculous, and analogous acts on analogous occasions, the greater exigencies of the Flood will fall under the same interpretation. It is a construction, also, to which all are entitled who may have any doubt arising from the exigencies of the occasion; and it may be definitively settled by an appeal to analogies, some of

which, like the supernatural pestilence, hailstones, &c., display an imitation of the results of natural laws. Analogous to the case before us is that of Elijah, who was fed by ravens; and at another time he was miraculously supplied with food by an angel, and "went in the strength of that meat forty days and forty nights unto Horeb, the Mount of God." And there was Jonah for three days and nights in the "fish's belly," without food or air—not a *whale's* belly, according to objectors, with "a throat *too small*," but by "a great fish *prepared* by the Lord to swallow up Jonah," and therefore with a throat sufficiently ample. Nor may the manna and quails with which the Israelites were fed be neglected. But these may not be regarded as proper analogies. Consider, then, how "Elijah, and the widow and her house," "did eat many days" of "a handful of meal in a barrel, and a little oil in a cruse;" "and the meal wasted not, neither did the cruse of oil fail, according to the word of the Lord which He spake by Elijah." Also, Elisha's multiplication of the widow's oil; Elisha's provision of food for one hundred men; and again when he prophesied of plenty, on which occasion the servant of the king was trodden to death because *he would not believe the prophecy.*

This brings us, also, to the exact parallel with the case of the Ark supplied by our Lord's miracles when He fed the multitudes, and His reproach of His disciples for not appreciating them. Also, the conversion of water into wine, as a luxury. But the preservation of man and animals, at the crisis of the Flood, "*to keep seed alive upon* THE FACE OF ALL THE EARTH," was only second in importance, in the Designs of Providence, to their original creation; and we may therefore safely conclude that any emergency in respect to food was abundantly satisfied according to the numerous parallel instances which illustrate the subject. But if all the ancient miracles be rejected as "Myths," we shall still possess in the miraculous increase of the "loaves and fishes" all that is necessary to maintain inviolate the perfect consistency of such a miracle in behalf of the helpless occupants of the Ark; although it was not considered important to reveal the fact. And it can not be too forcibly stated that there is no miracle, except the Resurrection of Christ, which is distinguished by designs in any degree comparable with those which attended

the preservation in the Ark, and by so much the more, therefore, should the Narrative of the Flood be entitled to our confidence.

The possibility of miracle in respect to food, as also that of a miraculous dispersion of the animals, however unnecessary either may have been, harmonizes with the miraculous assembling of the animals, as shown by the necessities of the event, and as declared by the statements that—"*Two of every sort* SHALL COME UNTO THEE"—that "They went in *unto* Noah *into* the Ark"—four times repeated, and in the same words; and that "God *remembered* Noah and every living thing, and all the cattle that was with him in the Ark"—"God spake unto Noah, saying, *go forth* of the Ark," &c. And here I may remind those critics upon the ways of Providence who insist that if the Flood was at all miraculous it should have been altogether so, that the instrumentality of man was generally enlisted in accomplishing miracles that related to him. Besides the "very inadequate size of the Ark" which is generally alleged, MILLER, like many others, raises the objection that there would have been "*an enormous expense of miracle*" in assembling and distributing the animals—somewhat less, however, than in their creation either before or after the Flood. It exceeds the comprehension of the Rev. Dr. J. PYE SMITH, who, in speaking of the assembling of the animals from all quarters, remarks that—"We can not represent to ourselves the idea without bringing up the thought of miracles *more stupendous* than any that are recorded in Scripture, even what may appear appalling in comparison. The Resurrection of the Lord Jesus sinks down before it."!!—*Geology*.

But the Resurrection of our Lord was no greater miracle, independently of its objects, than the inception of His humanity, or the resurrection of Lazarus, &c. The question turns wholly upon what Revelation says, not upon any comparisons with other miracles. Who shall calculate the dynamics of a miracle? The apostrophe, I say, of our Reverend Author is a mere fiction. And yet these same Philosophers can see nothing miraculous or improbable in their supposed creations and extinctions of animals at various epochs in their geological eternity. But there should certainly be no difficulty with those who believe in Creation as taught in the Mosaic Narrative, in not only admitting the com-

paratively insignificant events of the Flood, but in realizing in the preservation of man and animals "to keep seed alive upon all the face of the earth," instead of a new creation, a sublime display of consistency and Unity of Design.

Our Reverend Author last quoted should have said to an unbelieving world that the oft-reiterated declaration that the animals *came unto Noah, two of every sort, and went in unto him into the Ark*, in connection with the surrounding circumstances, is one of the strongest proofs, of an internal nature, of the perfect accuracy of the statement—(carrying with it, I say, its own conclusive proof)—that ever made its demand upon human reason. Nay more: so circumstantial is this part of the Narrative, it would seem as if the Inspired Writer was anticipating the incredulity of mankind in relation to the Flood, as in the case of his definition of the word Day. (See Chap. XIV.) It is not said in the usual brevity of Scripture language—they went into the Ark; but in the first place we read that "*Two* of every sort shall COME UNTO thee;" and that "There WENT IN *two and two* UNTO Noah *into* the Ark"—that "They WENT IN *unto* Noah *into* the Ark *two and two* of all flesh"—"And they that WENT IN, WENT IN *male and female of all flesh.*"

But after all, in this miraculous assembling of the animals, there is scarcely a perceptible difference from that instinctive faculty which guides the carrier-pigeon to its home from distant regions, or a bee to its hive, or which admonishes the feathered tribes of coming winter, and directs their flight to warmer climates; while, also, there is a marvellous analogy in the two cases. A slight modification of this law of Instinct would have impelled the animals to look out for safety where it could only be found—the finding of the Ark by the animals being scarcely more difficult than that of the *hive* by the bee. But however this may be interpreted, there can be no evasion of the fact that the influences which directed the animals to the Ark were limited to a very few, and that with these impelling motives must have been associated a Providential care in other respects. The affirmations are very direct, and correspond with the exigencies of the occasion. And equally so is it with all the other statements that I shall have considered in the Narratives of the Flood and of Creation. In the instance before us, had the writer been

silent upon the matter, and especially had he said that *Noah assembled* the animals, our Reverend Author, and all other doubters, would be quite justified in discrediting the statement. And yet that would have been the natural language of an impostor; especially in a Narrative of such extreme brevity. And it may be here said, as of the Narrative of Creation, that had the writer betrayed an attempt to expound what is supernatural in his account of the Flood, he would have stamped it as a mere romance of man. And yet who will doubt that an uninspired writer capable of constructing this remarkable Narrative would have anticipated the objections that have been alleged, and have therefore made some explanation of the manner in which the animals were induced to "come unto Noah into the Ark," and particularly, also, their limitation in most instances to two of each species, and those two of the opposite sexes; the harmony that prevailed among them; something about an adequate supply of food, especially the varieties; how the interior of the Ark was arranged, and other analogous details; how the fountains of the great deep were broken up, and the windows of heaven opened; why fifteen cubits of water should have been enough (as will be seen when we reach the coal-formations) to have covered all the high hills, while it is palpable, also, that an uninspired writer would have stated the general depth in miles instead of cubits—well knowing what an outcry would arise against his apparently contradictory statement. He would also have supplied some information as to the dispersion of the animals; and a variety of other details as to the events of a year among the assembled representatives of all the creatures of the dry land, which an impostor would have invented not only for the credibility of his story, but to render it a captivating romance. But with all this internal proof of a direct Revelation should be taken also the corresponding evidence embraced in the Narrative of Creation. (See Chapter XIV.) The concurrent testimony of both narratives in their internal proof, especially the brevity, exactness, and consistency of their statements, addresses itself with such force to human reason as would seem to be irresistible. And so it is, indeed, with all else in the Scriptures where abstract miracles are the subjects of communication. There is no explanation. Faith is so peremptorily challenged that it forms, in itself, a system of

internal proof of the Inspiration of the Bible; and when the statements are considered analytically, each one manifests a strong relation to the collective force of the whole.

It is a primary object with all the opponents of Revelation to expunge the miracles. This is their first position on approaching the Noachian Flood; assuming, after the manner of HUGH MILLER, that it could not have happened without the interposition of Divine Power, and therefore it never happened. "And be it remembered," says Hugh Miller, "that the *expedient* of having recourse to *supposititious* miracle in order to get over a difficulty *insurmountable on every natural principle*, is not of the nature of argument, but simply an evidence of the want of it." That, however, does not in the least preclude argumentative proof of the occurrence of miracles. I profess, for example, to have argued, beyond contradiction, the occurrence of the events of Creation exactly as related by the exigencies of facts (Chapter VII.), and by the internal proof supplied by the Narrative (Chapter XIV.); and to have equally demonstrated the occurrence of the Flood, and its miraculous nature, by the Narrative itself, by the dimensions of the Ark, by the coal-formations, by the boulders, and other diluvial drift, &c.

Objections like the foregoing affect the credibility of all miracles, while that which relates to their magnitude, so often made, would at once obliterate the Narrative of Creation. But there is no difference in miracles with the Supreme Being. They all involve the exercise of Creative Power. The speaking of the Universe into existence "in the beginning"—stocking it with animals, &c., was no more to Him than the management of the Flood, or the creation of a grain of sand. Given the grain of sand, there is no difficulty with the rest. And so, also, if He was instrumental in directing or conveying a single animal to the Ark, the whole difficulty vanishes; for it is much more probable that His interposition would have extended to all the exigencies of the case than to have been limited to a part. Miracles, if at all doubtful, should be estimated according to their probabilities or surrounding circumstances, not by their magnitude. What shall be said of the dynamics of the miracle, and on no very important occasion, of which Isaiah speaks as "*The Lord's work, His strange work, His Act*, His strange Act?" That the

earth ceased its diurnal revolution when the sun and the moon *stood still* for about a whole day at the command of Joshua (and in language as correct as that of *rising* and *setting* of the sun), is just as probable, and as possible, as the miracle of the piece of money found by Peter in the mouth of a fish.* The one was as "light a thing in the sight of the Lord" as the other. They are all equally upon a par in principle; and if the objections to the Flood continue to prevail on account of its miraculous nature, every other reputed miracle must be regarded as an imposture. All the nations of the earth will have been mistaken in their belief of such a catastrophe—all Christendom, until the advent of Theoretical Geology, and equally also our Lord himself, will have been grossly deceived by the most marvellous and stupendous imposture ever practised successfully upon mankind.

Every event of the Flood that could not have been delegated to the instrumentality of man, or have devolved upon the established laws of Nature, must be ascribed in undoubting faith to God's Providence, or the Narrative must be abandoned as an imposture perpetrated upon an unenlightened world without any conceivable motive, by a writer of extraordinary mental capacity and acquirements, of apparently the most devout convictions, conscious of the great improbabilities that would be urged by the unbeliever, knowing well the critical acumen with which the man of faith, as well as the scoffer of Providence, would penetrate to the very "roots" of every Hebrew word, yet the writer abstaining from all explanations that might have fully protected the credibility of his story.

Nevertheless, it was as much a part of the economy of God's Providence to employ the laws and agencies of nature in all the events of the Flood that admitted of such instrumentalities as He manifestly did in organizing the earth. (See Appendix I.) But in all such cases there was a direct exercise of Creative En-

* The miracle relative to the sun and moon, and that of the shadow on the dial of Ahaz, have been ascribed by some to "a peculiar refraction of the sun's rays." But this would have been as much a miracle as a cessation of the earth's revolution in one case, and its reverse revolution in the other. This, however, will not explain the apparent cessation of the moon's motion; and, moreover, had it been said that the sun alone stood still, the statement would have been obviously a fabrication; while, on the other hand, the moon being included, in those days of astronomical ignorance, forms a demonstrative proof of the truthfulness of the record.

ergy in giving a special determination to the operation of established laws. So far, therefore, many events of the Flood were of a miraculous nature, since they could not have happened without a special intervention of Divine Power quite as direct and specific as God's instructions to Noah when he was rendered instrumental, and more or less independently so, according to his ability to carry out the duties enjoined upon him. In the construction of the Ark, for example, he required no Divine co-operation, while the assembling of the animals involved an immediate interposition of Divine Power. There was probably no event of the Flood in which the laws and agencies of Nature were not rendered instrumental; which so far distinguished all such phenomena from the strictly miraculous. Could it be shown that the Flood was attended by events not in harmony with the laws and conditions of Nature, the events to that extent must be referred to an exclusive act of the Creator. This is strictly *miracle*, and is equivalent to the original acts of Creation, though distinguished from those as constituting no part of the system of Nature, but merely forming isolated events. But as God is the Author of Nature, He may, of course, give a special determination to its forces and laws for the production of events which shall harmonize perfectly with such as are their natural results; as doubtless occurs in the present order of nature, when miracles have been suspended. Hence the difficulty of appreciating the Divine interposition on occasions which are not extraordinary, or distinguished by some special proof, as in the organization of the primary rocks. (See Appendix I.) Here was a direct co-operation of Creative Energy with the properties which had been impressed upon matter, and therefore an imitation of natural laws as it respects the formation of the crystals. But the Deity may act in direct opposition to the laws of nature in bringing about special events, and yet there will be no suspension of those laws excepting in their relation to the particular events; as in the case of the sun and moon "standing still." The philosophy of such phenomena rarely engages our attention; and just so it is when the Deity interposes His power to bring about some particular event in the ordinary affairs of mankind. But there is an acknowledgment of this direct exercise of Divine Power in every prayer that is made. There is, how-

ever, no other manifestation of Divine agency than what may be inferred from subsequent events that appear to occur in a natural manner. The organization of the earth is a somewhat parallel case, which, until the present showing, has been supposed to have been exclusively the work of natural causes. But should animals or plants become apparently the products of a "creative law," that, as I have shown, would contradict all law, and be exclusively the direct work of Creative Energy. (Chapters VII. and VIII.) The multiplication of food in the Ark would have been also, of course, an act of exclusively Creative Power.

But my suggestion relative to a miraculous increase of food does not rest in the least, as has been fully shown, upon any possible want of space in the Ark, but upon the rejection of all miracles, as well, also, upon the assumptions that the capacity of the Ark was inadequate, and that it was impossible to have supplied the carnivorous tribes with food of an animal nature. MILLER, in his usual manner, remarks of the latter, that "It seems to have been generally taken for granted that the flesh-eating animals entirely changed the nature indicated by their form of teeth, their stomachs and bowels, and fed exclusively on vegetable substances." We suppose no such absurdity. There may be readily found what will be amply sufficient for this purpose without a resort to such a miracle. Our estimated number of carnivorous beasts is 514, or, in pairs, about 1030 individuals, varying in size from the lion to the weasel. To these must be added the carnivorous birds and insects. Of the species of animals that went in by sevens there were 166, of which 20 were of the ox tribe, and others down to the size of goats and antelopes. Of these every seventh, or 166 individuals, were intended for sacrifice, and when thus offered they would afterwards have furnished an average of half a carcass daily of fresh meat. This, however, was greatly insufficient; but we need not surmise a miraculous increase even of this food, for we can readily look to Noah's skill in preserving any quantity of meat against putrefaction; and he probably understood the art of *drying*, and *smoking*, and *salting*, as well as our own generation. Moreover, Noah had the warning of more than one hundred years for all such purposes.

As to the objection founded upon the dispersion of the animals after the Flood, it may be reasonably supposed that the event was or was not the result of Divine interposition. The probability is that the various parts of the globe were so connected as to have admitted of a natural process. It may have been, therefore, a simple matter of Instinct as it respects the regions adapted to the peculiarities of the animals, since the point of departure for migration was in a temperate region. It is more probable, however, and in every respect as consistent, to suppose that the animals went abroad much after the manner in which they "came unto Noah."

And here it may be well to disarm the unbeliever of his objection that the Ark could not have rested upon the *top* of Mount Ararat, as it is in the region of perpetual frost, and is also too steep for the descent of the animals.* It is not, however, so stated, but that "*The Ark rested upon* THE MOUNTAINS *of Ararat;*" and therefore it may have been upon a slope not a dozen feet from their base, or more probably upon the upland valley which unites the two mountains by an interval of about seven miles; and certainly no better place could have been chosen; or, if it be preferred, could have *happened.* Had it been said that the Ark rested upon the Alpine Mountains, Theoretical Geology would scarcely assume that the summit of Mont Blanc was the place indicated; nor will it surmise that the historian intended to imply that it rested upon the tops of the two mountains of Ararat. And to save the objectors any farther trouble over this

* Among the greatest objectors to the Narrative of the Flood is, as we have seen, the Rev. Dr. J. PYE SMITH, who goes on to contribute his clerical influence in the following manner:

"Mount Ararat," he says, "is nearly the height of our European Mont Blanc, and perpetual snow covers about five thousand feet from its summit. If the waters rose, at its liquid temperature, so as to overflow that summit, the snows and icy masses would be melted; and, on the retiring of the flood, the exposed mountain would present its pinnacles and ridges, dreadful precipices of naked rock, adown which the four men and four women, and with hardly any exception the quadrupeds, would have found it utterly impossible to descend. To provide against this difficulty, to prevent them being dashed to pieces—must we again suppose a miracle? Must we conceive of the human beings and the animals as transported through the air to the more level regions below; or that, by a miracle equally grand, they were enabled to glide unhurt down the wet and slippery faces of rock?"—*Scripture and Geology.*

Our Reverend Author could not even surmise the possibility that the Ararat of the moderns is a very different mountain from that which is so called in the Narrative.

subject, we may assure them that the *dove* would have instinctively preferred its quarters in the Ark to the cold regions of Ararat (if the mountains be truly known); while, also, in respect to the *olive*, if the plant now known as such does not grow in that region, it is highly probable, as in the case of numerous plants far more recently described by Hippocrates and Theophrastus, that the name of olive was applied to a very different plant from our own. (See Appendix III.)

Even that beautiful and sublime emblematic pledge of peace to the earth has not been allowed by the commentators upon "evening" and "morning" the obvious import which the nature of the Covenant suggests. That the *bow* had obeyed the established law of nature from the time the "first mist went up to water the whole face of the ground," it would be absurd to deny; and the expressions—"I do set my bow in the cloud," "and the bow shall be in the cloud," as a token of promise, evidently mean that now for the first time it is to be regarded in that acceptation, and that the order of nature shall remain forever after as ordained at the day of Creation. And is there not something of Divinity in the significance of the sign itself from its associations with an element of the Flood; and, while it thus reminds us of that catastrophe, it is a sure pledge of beneficent purposes in the clouds which it adorns. A familiar and impressive object, and one, too, which could be witnessed in all places of the earth, and as uniting the past with the future, was clearly most becoming the wisdom and beneficence of the Creator. Instead, therefore, of raising the objection, which is often made, that the Narrative violates the laws of nature by affirming (what it does not) that the *bow* was a special creation in commemoration of the Flood, it should be regarded in its assigned relations to that event as utterly beyond the conceptions of human ingenuity. The phraseology was best adapted to the conventional usages of mankind; and they who insist upon its conflict with nature are the very ones who bend the Mosaic Record of Creation to any hypothesis that any new disclosure in Geology may suggest. Again, we have seen that the heathen nations must have obtained their knowledge of a general Deluge either from Noah and his descendants or from the revelation to Moses, which suggests, in the present connection, a circumstantial proof of the authenticity of the Narrative

in the remarkable coincidence supplied by Homer when he presents the rainbow as a perpetual token of hope, and how, both according to him and Hesiod, the gods swear by the rainbow, as personified by Iris.

Some writers, in recent and former times, who reject the universality of the Flood on account of its involving "the miraculous Power of God," admit, as we have seen, a partial deluge and preservation of useful animals, and a new Creation so far as necessary.* Thus, the Rev. Dr. HITCHCOCK remarks (in *American Biblical Repository*, January, 1838), that—

"Some, we know, will cut the knot at once by imputing the whole to the miraculous Power of God," &c. "Nor do we see any need of miraculous agency in the case, and therefore ought not to admit of it without strong proof." And yet he says in the same article that "A perusal of the Scriptural Narrative of the Flood is apt to leave the impression on the mind that *it was miraculous.*" He also imputes "infidel cunning" to Sir CHARLES LYELL for his simple admission that the Deluge might have been universal. At the same time, our Author "cuts the knot" and "vindicates the Scriptures" after the following manner. Thus he says:

"In the first place, the Deluge may not have been universal. If this be admitted, the animals that existed in remote countries may not have perished." "In the second place, a *new creation* of animals and plants may have taken place subsequent to the Deluge. We admit that the Scriptures are *silent* on the subject, and therefore *they leave us free to reason concerning* it from philosophical considerations."!! "*The numerous examples of new creations* which Palæontology furnishes show us that such is the

* A few years ago the Rev. Dr. Hitchcock concluded an inquiry into the opinions of Geologists upon this subject with the following summary classification:

"The first class deny that any universal or even general deluge has occurred on our globe, and suppose that the deluge of Noah was local like that of Deucalion, Ogyges, and others.

"The second class admit a general Deluge, but suppose it took place before the creation of man, and make the Mosaic Deluge a local event.

"The third class suppose that the traces of several extensive, if not universal, deluges are to be found on the globe, and that the last of these events may have been identical with that of Noah."—*American Biblical Repository*, January, 1837.

At the present day I am not aware that any Geologists recognize the Deluge as described in Genesis.

law of the Divine Administration." (See Chapters VII. and VIII.) And yet our Author, within six pages of the last quotation, gives us the following example of the consistency of his "philosophical considerations." In conceding a limited preservation in the Ark, he thinks that this was probably for the purpose of "furnishing the post-diluvians at once, *without a miracle*, with the necessary domestic animals"—notwithstanding his opinion that a new creation of animals and plants took place after the Flood, if such a debacle be admitted.

Whatever contradictions of the Narratives of Creation and the Flood Palæontology may deduce from the exuviæ of extinct animals, there can be no doubt that, had our Reverend Author taken the same liberty with any human production as with the Narrative in the foregoing quotation (as has been done also by others), he would have been condemned universally, even though it falsified the writer only in unimportant matters. But in the statement before us the falsification is made to affect the most vital part of the Narrative; since it is distinctly affirmed that there was no post-diluvian creation in the numerous statements relative to *the very objects* of the Ark, which were to supersede the necessity of a new creation, and thus maintain an Unity of Design, and a consistency with the Creation at "the beginning."

The opponents of Revelation see no objection to "a new creation of animals and plants," if it can be established that the Flood was simply a local torrent of water, and thus bring it down to a geological debacle; while, in the mean time, they revolt at an interposition of Divine Power in the events of a Deluge which that Power decreed for unexampled purposes, and which could not be fully accomplished without such interposition. It is of the nature of a compromise with the man of faith. But what proportion does a miraculous institution of a general Flood, or a tributary aid in the assembling and dispersion of the animals, &c., bear to "a new creation?" Which would require the greater proportional exercise of Creative Power, the Providential influence upon existing nature without disturbing its laws, or a repetition of the original creation of animals and plants out of the dust of the earth? But all this becomes the more discreditable to human reason when it is considered that

this "new creation" means spontaneous generation. (Chapters VII. and VIII.)

The hypothesis of a *local* flood and a "new creation" has been invented to explode the Mosaic Narrative. It is incomparably more improbable than the theory of a universal Flood and its miraculous superintendence; while the doctrine is a clear impeachment of the Record that the Ark was designed "*to keep seed alive upon all the face of the earth.*" But the admission of even a partial Flood, and a partial preservation of animals, demands as much "the miraculous Power of God" as the universal—since such a flood must have been equally instituted by that Power, and *the waters miraculously maintained* in their supposed *isolated* and *accumulated* condition, and the Ark demanding the same Providential care as in the case of a general Flood. Nay more: the hypothesis imputes inconsistency to the Creator by its partial act of preservation when it assumes that it was His purpose to recreate all other land animals. And how will it consistently explain the neglect of the Narrative of announcing the "new creation" subsequently to the Flood, when the original creation "in the beginning" is so circumstantially revealed? Why, I say, is there no allusion to a post-diluvian creation; especially after all the portentous account of the destruction of mankind and of all those animal tribes which held so conspicuous a place in the Narrative of Creation, and more especially in consideration of the repeated declaration which is made of a universal preservation in the Ark, and which otherwise would be a palpable contradiction without a conceivable motive?

Wherever in the Holy Scriptures the Flood is the subject of remark, whether by the Prophets, or our Lord, or his Disciples, it is in a universal sense; and its universality, destructiveness, and general miraculous nature, are very forcibly declared by the "*covenant, that neither shall all flesh be cut off any more by the waters of a flood; neither shall there any more be a flood to destroy the earth.*" And in testimony of this the rainbow was appointed, that all nations might be reminded of the occurrence on turning their eyes to the clouds—a phenomenon which probably attended the first "mist that went up from the earth and watered the whole face of the ground"—but now, for the first time, and with wonderful appropriateness, from its dependence upon water, and

as the only universal phenomenon, designated as an emblem of Divine mercy.

While one class of commentators upon the Narrative have been troubled about an adequate supply of water that should cover all the high hills, another class have cut the knot by supposing a creation for the occasion, and with this immense redundancy upon their hands they have had a greater trouble in getting rid of it. This, indeed, has been an old difficulty. Thus, Professor WOODWARD, in his "*Account of the Universal Deluge*" (1690), remarks that—

"Men of capacity, in all ages, have been at a loss to seek what was become of the water, or where it would all find a *reservatory* capable of containing it. The greatest part of them were forced at last to *mince the matter*, and make only *a partial* one of it—restricting it to one single country, Asia, or some lesser portion of land."

And still, it is asked, without surmising a miraculous increase of the waters, "How could they have evaporated in the short time allotted to the Flood by the Record?" The inquiry, like all others that are raised as objections, may be shown *by the Book* to be without foundation. The waters subsided after the same manner in which they had invaded the earth when "all the fountains of the great deep were *broken up*." There was no evaporation in the case, any more than there was the imputed necessity of their extinction. But the Narrative shall answer for itself—"*And the waters* RETURNED *from off the earth continually*." They "*returned*" into caverns which were ultimately and progressively formed as a consequence of those upheavals by which the "great deep had been broken up." The language here is wonderfully precise and harmonious, and will admit of no perversion. It corresponds, also, exactly with what the coal-formations testify of the progressive rise of the waters, and with what the boulders proclaim of the corresponding and more violent recession of the waters. As to the expression, "God made a wind to pass over the earth, and the waters assuaged," it bears the same relation to the "returning of the waters" as the "forty days' rain" does to the "breaking up of the fountains of the deep."

And how admirably does the Narrative present the great fact

in a single sentence, although apparently in opposition to other statements, and which has been alleged in proof of the shallowness of the Record. It declares, in the face of universal criticism, that "FIFTEEN CUBITS *upward did the waters prevail, and the* MOUNTAINS WERE COVERED." It remains to be seen how an average depth of less than thirty feet of water would have inundated "all the high hills and mountains;" and as it is scarcely probable that the statement was founded upon a calculation that has been neglected by all others, it follows that it could have proceeded only from Divine Revelation. (See Appendix III.) It may be also said, that while the breaking up of the great deep doubtless involved a direct interposition of Creative Power, all the subsequent physical results of the Flood may be readily resolved through natural agencies—the rain, the submersion of mountains, the coal-formations, the boulders, &c., as will be shown in Appendix III. We ask only for some extraordinary aid in the sudden upheaval, for a contemplated purpose, of the bottom of the ocean, which, in view of the importance of the occasion, will be conceded to be quite as probable as the division of the Red Sea and of the River Jordan for the accommodation of the Israelites. But we would not surmise such an interposition, had we any confidence in the geological submersions and upheavals to expound the calcareous strata of the coal-fields. Nevertheless, it should be said that there was another object besides that of facilitating the journey of the Chosen People in affording them an easy passage across the sea and the river; and as the same object was also contemplated by the Flood, and in view of the great disparity in the events, and therefore the greater probability of Divine interposition in deluging the earth, we will have before us the reasons assigned by Joshua for the miracles at the Red Sea and Jordan. Thus Joshua—"For the Lord your God dried up the waters of Jordan from before you, until ye were passed over, as the Lord your God did to the Red Sea which He dried up from before us, until we were gone over; *that all the people of the earth might know the hand of the Lord, that it is mighty, that ye might fear the Lord your God forever.*"

The expressions "The windows of heaven were opened," and "The rain was upon the earth forty days and forty nights," appear to denote a Divine agency in that phenomenon; but

the immense evaporation attending the influx of the waters upon the whole face of the earth, and their turbulent movement, was probably alone sufficient; while the greater violence of the recession of the waters would have produced such a commotion of the atmosphere as to occasion "a wind to pass over the earth." Each phenomenon is alike expressive of the vastness of their respective causes.

From what has been already said, and in anticipation of our remaining proof of a general Deluge embraced in Appendix III., it becomes important to show a correspondence in the details of the Sacred Narrative with all these collateral evidences, and thus place the Divine Record upon its own intrinsic merits. But, in the first place, it should be said that some distinguished and Reverend Objectors, appreciating the directness of the Narrative, have endeavored to circumvent its meaning, as in the case of the Narrative of Creation (Chapter XIV.), by a forced parallelism with expressions in Scripture which are as clearly intended in an indefinite sense as the language of the Narrative is precise and definite. Thus the Rev. J. PYE SMITH, in his *Scripture and Geology*—

"The expressions of *universality* in regard to the Flood are these: 'The waters prevailed exceedingly upon the earth, and all the high hills that were under the whole heaven were covered.'"

That is all. And thus our Author would leave his reader with the impression that there is nothing more in the Record of the Flood that expresses the universality of that debacle, when, in reality, almost every line, certainly every statement, embraces precisely, and the whole collectively, in varied phraseology, the same comprehensiveness. The passage thus isolated is then brought into apposition with isolated passages from other parts of the Bible, by which our Author would reduce the whole Narrative of the Flood, in all its precise and varied expressions of universality, to a parallel with what is as obviously figurative, or plainly intended in a limited acceptation. But our Author shall present his own illustrations, as showing that "UNIVERSAL *terms* are often used to signify only a *very large* amount in number or quantity. Thus—'And the famine was upon all the face of the earth; and all the earth came to Egypt to buy from Joseph, for the famine was extreme in all the earth;' yet it is *self-evident* that

only those countries are meant which lay within a practicable distance from Egypt.—'All the cattle died;' yet the connection shows that this referred to some only. 'The hail smote every herb of the field,' &c.—'All the people brake off the golden earrings, and brought them unto Aaron;' meaning, undoubtedly, a large number of persons. 'And all the earth sought the presence of Solomon, to hear his wisdom'"—besides other analogous examples by which our Reverend Author would interpret the phraseology of the Almighty as rendered in the Narrative of the Flood!

Hugh Miller assumes, in his *Testimony of the Rocks*, that "It may be *fairly* concluded that if there be *a show of reason* against the theory of a flood purely *local, it has not yet been exhibited.*" Of course, therefore, there is no "show of reason" in the Narrative itself. Our Author, also, after the usual manner, presents what he would have us regard as parallel examples, from other parts of the Bible, for the purpose of showing that the language of the Narrative is an exaggeration of the facts which it professes to reveal. Thus he says—

"There is a numerous class of passages both in the Old and New Testament, in which, by a sort of metonymy common in the East, a considerable part is often spoken of as the whole, though in reality often greatly less than a moiety of the whole. Of this class are the passages in which it is said, that on the day of Pentecost there were Jews assembled at Jerusalem 'out of every nation under heaven;' 'that the Gospel was preached to every creature under heaven;' 'that God put the dread and fear of the children of Israel upon the nations that were 'under the whole heaven;' that 'all countries came into Egypt to Joseph to buy corn.'"

Another writer of distinguished consideration, the Rev. President Hitchcock (in *American Bibl. Repos.*, Jan., 1838), begins a similar interpretation of the Narrative with a conciliatory tone, which we have seen to be remarkably characteristic of Theoretical Geology when about to bring its support to Revelation, thus—

"As to the extent of the Noachian Deluge, the language of Scripture seems at first view to be *very decided.* 'And the waters prevailed,' &c. Alike universal are the terms employed *re-*

peatedly to denote the destruction of animals upon the earth, &c. In spite of these *strong expressions*, not a few able writers have understood them as simply universal terms with a limited meaning." Our learned Author then proceeds to select certain examples from other parts of the Bible where universal terms are plainly meant in a limited sense, such as, "'All countries came into Egypt to Joseph to buy corn, because that the famine was sore in all the lands.' 'And all the earth sought to Solomon to hear his wisdom.' Even in the description of the Flood there is ONE of these universal terms employed whose meaning *we are obliged* to limit. It was commanded to Noah—'Of every living thing of all flesh, pairs of every sort shalt thou bring into the Ark to keep alive.' Here we must limit the term *all flesh* to such as needed a shelter from the cataclysm."

The reader can require no assistance in placing the right interpretation upon the foregoing quotation; and I shall therefore only say of it, that our Author is unhappily mistaken in affirming that "we are obliged" to limit the meaning of the Inspired Writer in that "one" universal term, since the Writer had *repeatedly* limited it himself, but to which our Author suppresses all allusion! He finally makes the deliberate statement that "We have endeavored to show that there is NOTHING in the Scripture account of the Deluge that requires us to consider it *universal, except so far as man dwelt on the globe*"!!—notwithstanding the same language is applied to all land animals as to man.

Our representative Author is ultimately led to a palpable though very natural contradiction of himself, and in the same article just quoted; and the more remarkable in consideration of the rebuke of Sir Charles Lyell, as appears in the subjoined note. It is also a memorable example of the conciliatory manner which has involved so many in the snares of Theoretical Geology, and which is of the same nature precisely as the language rebuked. The reader will, therefore, naturally inquire with himself whether the rebuke should not recoil with greater force upon him who administered it; and it may also become a question as to how extensively it may apply in Theoretical Geology. But read the note. The intended quotation from our Reverend Author is as follows:

"If I mistake not, then, the deluges of Scripture and of Geology *may or may not* have been *universal*, *in consistency* with the language of the Sacred History, and with the facts of Science as they are at present understood. *They agree*, therefore, in having been very extensive, if not universal. And in view of *such proofs of their identity* it should require decisive evidence to the contrary to disjoin them."*

* When the article appeared from which the foregoing quotations are made, the "glacial theory" had not fully crushed out the Narrative of the Flood, and our representative Author introduces Sir CHARLES LYELL as speculating upon the universality of the cataclysm; at which time, also, Sir Charles appears not to have made up his mind whether the Narrative or Theoretical Geology should prevail. In this instability of his faith Sir Charles is quoted by President Hitchcock as saying that—

"For my own part, I have always considered the Flood, *when the universality in the strictest sense is insisted upon*, as a supernatural event, far beyond the reach of philosophical inquiry, whether as to the causes employed to produce it, or the effect most likely to result from it." He is also quoted as saying that "There are no terms employed in the Narrative that indicate the impetuous rushing of the waters either as they rose or when they retired."

Now there is nothing in the foregoing extract but what had been the usual conciliatory manner of Theoretical Geology. It must be admitted, however, that the motive is rather more open to criticism than would be most conducive to the success of abolishing the Mosaic Narrative. It did not, therefore, meet the approbation of the Reverend Doctor, that the Chief of his own School should have made even such a concession in favor of the possibility that "a supernatural event had occurred which was far beyond the reach of philosophical inquiry;" although it will have been seen above that our Reverend Author has expressed himself in precisely the same equivocal manner. Here is the commentary upon the foregoing quotation:

"What does Mr. Lyell mean by the phrase which we have italicized? Certainly not that he believes Noah's Flood was universal. What can he mean but that he should use such an argument with a man who was a strenuous advocate for the universality of the Deluge; while with one who supposed it partial he would consider it within 'the reach of philosophical inquiry as to the causes employed to produce it, and the effects most likely to result from it.' We know nothing of Mr. Lyell's religious creed. [!] But there is something in such an ambiguous mode of treating Scriptural subjects that reminds us of *Infidel Cunning* and *Duplicity*. We should not notice this language, however, had not the same thing struck us in other parts of Mr. Lyell's Principles of Geology. Thus, in giving the history of geological opinions in the nineteenth century, he says, 'It had been the *consistent belief of the Christian world down to the period now under consideration*, that the origin of this *planet is not more remote than a few thousand years*,' &c. Does he mean that this belief was *consistent* with the Bible? THEN HE WOULD ARRAY THE SCRIPTURES AGAINST GEOLOGY."!! That is our Reverend Author's trouble.—*American Bibl. Repository*, January, 1837.

The foregoing quotation is not intended as an example of personal feeling, but of that arbitrary disposition which tolerates no opposition, and which would gather all Christendom into the fold of Theoretical Geology.

It would have been desirable to have argued the question of a general Deluge upon geological facts alone, especially such as are supplied in boundless extent by the coal-formations, by the diluvial drift, by the fossil bones, and by Unity of Design, &c.; and from these considerations to have deduced, upon scientific grounds, the necessity of an universal preservation of individuals of all species of land animals by some special Divine Interposition. But Theoretical Geology has found it expedient to invalidate Revelation by such violent perversions of its language that it has forced upon believers in the Narrative the necessity of a critical comparison of its statements with the geological substitutions. For this reason I shall now proceed to place the statements of the Mosaic Record in what will be equivalent to parallel columns with the foregoing quotations by which the former are misrepresented, and that it may clearly appear that the Inspired Writer intended, in a variety of ways, to enforce the idea that *universality* was the leading principle in this miraculous event. I shall place each branch of the Narrative by itself, that it may be distinctly seen that *universality* is the unmodified characteristic of each, that each interprets and confirms the meaning of the others, and that they form one harmonious whole in circumstantial as well as general phraseology and in manifest intent.

1. UNIVERSALITY OF THE FLOOD.

"And, behold, I, *even I*, do bring a flood of waters upon the earth, to destroy all flesh, wherein is the breath of life, from under heaven; and every thing that is in the earth shall die."

"For yet seven days, and I will cause it to rain upon the earth forty days and forty nights; and every living substance that I have made will I destroy from off the face of the earth."

"In the six hundredth year of Noah's life were all the fountains of the great deep broken up, and the windows of heaven were opened.

"And the rain was upon the earth forty days and forty nights."

"And the flood was forty days upon the earth; and the waters increased, and bare up the ark, and it was lifted up above the earth.

"And the waters prevailed, and were increased greatly upon the earth; and the ark went upon the face of the waters.

"And the waters prevailed exceedingly upon the earth; and all the high hills, that were under the whole heaven, were covered.

"Fifteen cubits upward did the waters prevail; and the mountains were covered."

"And the waters prevailed upon the earth a hundred and fifty days."

2. UNIVERSAL DESTRUCTION.

"And the Lord said, I will destroy man whom I have created from the face of the earth; both man, and beast, and the creeping thing, and the fowls of the air; *for it repenteth me that I have made them.*"

"And God said unto Noah, The end of all flesh is come before me; for the earth is filled with violence through them; and, behold, I will destroy them with the earth."

"And all flesh died that moved upon the earth, both of fowl, and of cattle, and of beast, and of every creeping thing that creepeth upon the earth, and every man:

"All in whose nostrils was the breath of life, of all that was in the DRY LAND, died.

"And every living substance which was upon *the face of the ground*, both man, and cattle, and the creeping things, and the fowl of the heaven; and they were destroyed from the earth: *and Noah only remained alive, and they that were with him in the ark.*"

3. UNIVERSAL PRESERVATION.

"But with thee will I establish my covenant; and thou shalt come into the ark, thou, and thy sons, and thy wife, and thy sons' wives with thee.

"And of every living thing of all flesh, two of every sort shalt thou bring into the ark, to keep them alive with thee; they shall be male and female.

"Of fowls after their kind, and of cattle after their kind, of every creeping thing of the earth after his kind; two of every sort shall come unto thee, to keep them alive.

"And take thou unto thee of all food that is eaten, and thou shalt gather it to thee; and it shall be for food for thee, and for them."

"Of every clean beast thou shalt take to thee by sevens, the male and his female;

"Of fowls also of the air by sevens, the male and the female; to keep seed alive upon all the face of the earth."

"And Noah went in, and his sons, and his wife, and his sons' wives with him, into the ark, because of the waters of the flood.

"Of clean beasts, and of beasts that are not clean, and of fowls, and of every thing that creepeth upon the earth, there went in two and two unto Noah into the ark, the male and the female, as God had commanded Noah."

"In the selfsame day entered Noah, and Shem, and Ham, and Japheth, the sons of Noah, and Noah's wife, and the three wives of his sons with them, into the ark;

"They, and every beast after his kind, and all the cattle after their kind, and every creeping thing that creepeth upon the earth after his kind, and every fowl after his kind, *every bird of every sort.*

"And they went in unto Noah into the ark, two and two of all flesh, wherein is the breath of life.

"And they that went in, went in male and female of all flesh, as God had commanded him: and the Lord shut him in."

4. AN AMPLE PROVISION FOR AN UNIVERSAL PRESERVATION.

"Make thee an ark of gopher wood; rooms shalt thou make in the ark, and shalt pitch it within and without with pitch.

"And this is the fashion which thou shalt make it of: The length of the ark shall be three hundred cubits, the breadth of it fifty cubits, and the height of it thirty cubits."

5. ALL THE PRESENT LAND ANIMALS DESCENDED FROM THOSE PRESERVED IN THE ARK. NO POST-DILUVIAN CREATION.

"To keep seed alive upon the face of all the earth."

"Bring forth with thee every living thing that is with thee, of all flesh, both of fowl, and of cattle, and of every creeping thing that creepeth upon the earth; that they may breed abundantly in the earth, and be fruitful, and multiply upon the earth.

"And Noah went forth, and his sons, and his wife, and his sons' wives with him:

"Every beast, every creeping thing, and every fowl, and whatsoever creepeth upon the earth, after their kinds, went forth out of the ark."

6. THE PROMISEC ONFIRMS UNIVERSALITY.

"And I, behold I, establish my covenant with you, and with your seed after you;

"And with every living creature that is with you, of the fowl, of the cattle, and of every beast of the earth with you; from all that go out of the ark, to every beast of the earth.

"And I will establish my covenant with you; neither shall all flesh be cut off any more by the waters of a flood; neither shall there any more be a flood to destroy the earth."

"And I will remember my covenant, which is between me and you and every living creature of all flesh; and the waters shall no more become a flood to destroy all flesh."

In one series of the foregoing quotations it is variously said that the Flood was universal, and that all flesh shall be destroyed from the dry land; while in the case of the Promise it is affirmed that all flesh was destroyed that had not been declared to be excepted. And here, also, the dimensions of the Ark come in with a corresponding testimony. It is also a remarkable fact that the original word here used for *Flood* (מבול, *mabbul*) is restricted to the Noachian Deluge, and is not applied to any other inundation; thus showing that it was an unique event.

The logic, however, which Theoretical Geology, through many of its most able expositors, has founded upon the several series of the foregoing quotations is simply this, that "inasmuch as the statements—'All the earth sought Solomon, to hear his wisdom,' 'All nations came into Egypt to Joseph to buy corn,' &c., are evidently intended in a limited sense, therefore we are at perfect liberty to limit the meaning, in a corresponding manner, of all the apparently precise and positive statements in the Narrative of the Flood." But the examples by which it is attempted to frustrate the individual and collective statements of the Narrative in their obvious meaning of universality are abstract expressions, each relative to an event in itself significant of a limited extent, and in simple conformity, as Hugh Miller expresses it, with "a sort of *metonymy* common in the East" (page 644); while the affirmations of the Narrative were made by God, multitudinous in number, relative to various specifications, each ex-

pressing the exact meaning of the others, and every one declaring universality. When God himself speaks, it is not in doubtful language. Take the rule of interpretation as insisted upon by Theoretical Geology, both as to the Narrative of the Flood and of Creation, and how shall we dispose of passages like the following: "And *all the Nations of the earth* shall be blessed in Him" —"Look to Me and be ye saved, *all the ends of the earth*"— "That My Name might be declared *throughout all the earth*"— "For *all the earth is Mine*"—"Made heaven and earth, and sea, and *all* that in them is"—"I have sworn by Myself, that to Me *every knee* shall bow, *every tongue shall swear*"? These are only examples of a multitude of similar ones, while those of the "metonymy-sort" are rare, and their connection with the *context*, which is the only true rule of interpretation, shows us at once that they were intended in a limited sense. Where, then, would the logic of Theoretical Geology conduct us? where this appeal from the Creator to "a sort of metonomy common in the East?"

But, in reality, those who explain away the language of Revelation in the foregoing manner have no belief even in a local Noachian Flood. It is simply a ruse to reconcile the reader to a complete rejection of the Narrative. MILLER'S *Testimony of the Rocks* abounds with expedients of this nature, enforced by derisive satire.

As to those Geologists who admit, or affect to admit, a local Noachian Flood, they could not have been aware of what the facetious BURNET said about their philosophy in his once famous *Theory of the Earth*, nearly two hundred years ago. Let us, therefore, hear him:

"Some modern Authors," he says, "observing what straits they have been put to in all ages to find out water enough for Noah's Flood, *have ventured upon an expedient more brisk and bold* than any of the Ancients durst venture upon. They say Noah's Flood was not universal, but a national inundation, confined to Judea or those countries thereabouts; and, consequently, there would not be so much water necessary for a deluge of that kind." "If the Deluge was confined to those countries, I do not see but the borderers might have escaped, *shifting a little* into the adjacent places where the Deluge did not reach. But especially *what needed so much ado to build an Ark to save Noah and his fam-*

ily, if he might have saved himself and them only BY RETIRING *into some neighboring country;* as Lot and his family saved themselves by withdrawing from Sodom when the city was to be destroyed? Had not this been a far easier thing, and more expeditious than the great preparations he made of a large vessel, with rooms for the reception and accommodation of beasts and birds? And now I mention BIRDS, why could not they, at least, *have flown into the next dry country?* They might have perched upon the trees and the tops of the mountains, by the way, to have rested themselves if they were weary, for the waters did not all of a sudden rise to the mountains' tops." "But to argue with them upon their own grounds—Let us suppose only the Asiatic and Armenian mountains covered with waters; then, unless there was a miracle to keep these waters upon heaps, they would flow throughout the earth." "We may as well, then, expect that the Leman Lake should swell to the tops of the Alps, on the one hand, and the mountains of Switzerland and Burgundy on the other, and then stop, without overflowing the plain countries that lie beyond them."

Burnet, therefore, did not write in vain; for he now comes forward to meet a doctrine far more mischievous at the present day than when he flourished.

Returning again to the destructive effects of the Flood, we meet with the interrogatory—whence came the subsequent vegetation? That very natural inquiry I shall answer in my consideration of the Coal-fields (Appendix III.). In the mean time, some readers will doubtless feel alarmed for the safety of the Ark itself during its long exposure upon the tempestuous waters, especially considering its vast dimensions. But to quiet their apprehensions, I would say, in the first place, that it ought not to be doubted that the same conservative principle was in operation in that, and in all other respects, as manifested itself from the very beginning, when Noah was commanded to build the Ark, "to keep seed alive upon all the face of the earth." It would have been hardly consistent, after such preparations, to have left the vessel and its cargo to the destructive effects of the Flood; or, if it be preferred, it is not impossible that the Ark, like the Olive, may have been sheltered in some ravine of Mount Ararat. (See Appendix III.) But we have an ample reason

for concluding that there may have been a special Interposition on such an occasion in our Lord's rebuke of the wind and the waves for so comparatively small a circumstance as the preservation of Peter's life. Peter also "walked upon the water to go to Jesus; saying, Lord, save me. And the Lord said unto him, *O thou of little faith*, wherefore didst thou doubt?" We may therefore rely upon the assurance that "God remembered Noah, and every living thing, and all the cattle that was with him in the Ark," and therefore, also, the Ark itself.

APPENDIX III.

THE COAL-FORMATIONS.

It is my purpose in this Appendix to demonstrate very briefly (as already set forth in my work on *Theoretical Geology*) the dependence of the Coal-fields upon the Noachian Flood, and to indicate the *modus operandi* of that catastrophe in their production. It will be found to explain, in the most natural manner, all the difficult problems known in Geology as the "enigmas of the Coal-fields"—such as the general occurrence in northern as well as equatorial regions of tropical plants throughout their wide extent; the interposition of fossiliferous and other mineral strata; faults, dikes, breaks, &c.; the preservation of ferns and other delicate plants in a perfect condition; the strata of coal formed exclusively of leaves; the immense thickness of other strata; the absence of boulders and of other mineral rubbish; their general limitation to nearly a level with the ocean, or in valleys beneath the level; their occurrence mostly upon the southerly and easterly aspect of mountains; and whatever else, in this connection, that has given rise to a voluminous mass of speculations. Moreover, we shall have thus found in the Coal-fields themselves, and in each one of their "enigmas," the greatest monumental proof of a desolating and universal Flood. It is for the development of this proof, especially, that I have undertaken the inquiry, and as one of the principal means of sustaining the Sacred Narrative, and thus rendering it instrumental in crushing out the materialism of the age.

I may say, however, at the outset, that we might rest our great subject upon the *extent* of the Coal-fields alone; as will be sufficiently apparent as our inquiries advance. The Coal-measures occupy about 300,000 square miles of the earth's surface, or about a two-hundredth part of all the dry land, so far as yet discovered. Whence came the vegetable material, and at *one*

particular period, for all this imbedded carbon? Theoretical Geology answers—"From an atmosphere of carbonic acid gas!" But whence came the carbonic acid gas? Granting, however, an assumption so full of absurdities as it respects animal and vegetable life, such an atmosphere would not begin to explain, upon the geological hypothesis, the amount of the vegetable material in any of the thickest strata.

Again, where should we expect, upon our diluvian theory, to find the greatest amount of coal? Certainly in the United States of North America, southerly and easterly of the Rocky Mountains. It was not doubted by Geology, when it recognized the General Deluge, that it had its rise in the south-east; and the current, therefore, rushing in a north-westerly direction, would have swept the forests of the two Americas into the region of the United States, upon the easterly and southerly face of the mountains. The facts correspond with my theory. Of the 300,000 square miles of Coal-fields, 200,000, at least, lie in the United States, and the remaining 100,000 (which is a large estimate) are distributed over the rest of the world. But there doubtless remains to be discovered in the New World a far greater extent of this repository than the foregoing. Already, in the newly-settled State of Iowa, it is estimated that the bituminous Coal-fields occupy an area of 20,000 square miles. Was there in this region a greater concentration of carbonic acid than in all other quarters of the globe to an extent of more than ten times the ratio? While it should be considered, also, that neither animal nor vegetable life could have existed in the most moderate degree of the supposed atmosphere. Temperature is also an indispensable element in expounding an excess of vegetation in a region of country over that of all others; and were there, therefore, any foundation for the geological hypothesis of local growth, the tropical climates should possess the greatest bulk of the Coal-fields; to which may be added the very conclusive fact that plants of tropical growth form the most abundant material of the Coal-fields, even in high and dark northern latitudes. Moreover, we must look for their formation to a cause in simultaneous operation over the entire globe, and which came to an end in an equally simultaneous manner, and which has never been renewed, even upon the smallest scale. The cause

was, therefore, entirely foreign to the processes of nature. It was a cause, also, in perfect consistency with an antecedent tranquillity of the earth as favorable to vegetation as at the present day; and therefore the abundance of vegetation itself declares the fallacy of the geological assumption of universal torrents of water during the "carboniferous era," while the assumption is rendered still farther discreditable to Theoretical Geology by its demands for many alternations of tranquillity and luxuriant vegetations, and "submersions," and "upheavals," wherever a Coal-field is to be found.

Although the foregoing considerations manifestly disprove the geological interpretation of the slow formation of the Coal-fields, they may not so clearly refer their origin to the Noachian Flood; and in demonstrating the latter, the multitude of facts which will be employed for the purpose will be simultaneously arrayed against the geological hypothesis. But in the first place I may state that it is the general doctrine of Theoretical Geology that the Coal-fields are transformations of plants which grew in their neighborhood, and which were washed down by torrents of water into lakes and estuaries of seas, where they became overlaid by mineral strata. It is the doctrine, also, that there were as many successive growths of plants, generally of the large forest trees of tropical climates, and as many torrents of water as there are strata of coal in the different formations respectively. The hypothesis also assigns the strata of sand and clay to other torrents which happened during the suspension of vegetation; but it neglects all provision for renewals of vegetation, both as to seeds and soil, after the desolating torrents had ploughed its supposed favorite regions. But it sees no absurdities in the assumption of "an atmosphere of carbonic acid gas" to obtain an adequate supply of vegetation, and to expound the universal distribution of the Coal-fields. Nor does it explain how fragments of rocks and other mineral rubbish failed of being commingled with the strata of coal; besides other neglected "enigmas" which will engage our attention. In its characteristic manner it disposes of the numerous cases where the mineral strata consist of mountain limestone, and such as embrace marine-shells, by submerging the Coal-fields, but not the adjacent land, and without deranging the strata when submerged by the agency of ingulf-

ing earthquakes; and when vegetation is ready for another stratum of coal, an upheaving earthquake is invented to bring up the Coal-fields to an exact level, without disturbing their horizontal plane and well-adjusted strata, or molesting the adjacent timber-growing country. This process of sinking for mineral strata, and upheaving for the reception of layers of coal, is repeated as often as the calcareous strata may occur in any Coal-field, and is distinguished by as much evidence of design as the inventive ingenuity which found it out. But apparently a greater evidence of design consists in the failure of the torrents of water which hurl down the trees to carry along the mineral rubbish with the vegetable material, while other torrents ensue for the special purpose of sweeping down those mineral strata which can not be obtained by submerging the Coal-fields beneath the ocean. Farther: as the Coal-fields are allowed to be of simultaneous formation, it follows that the torrents of water were also of simultaneous occurrence over the face of the earth, succeeded by calms most favorable to a luxuriant vegetation, and without any analogies in the previous or subsequent history of the earth. It is assumed, also, that the Coal-fields after their formation were extensively invaded by "dikes" and "faults," as the result of violent volcanic action. And it is farther assumed that there existed at the highest locality in northern regions a tropical temperature during the "carboniferous era," and, of necessity, a simultaneous equatorial temperature of 200 degrees; this condition of things being supposed to have occupied about a million of years, when it came as abruptly to an end as it had its beginning. This exalted temperature is assumed for the single purpose of accounting for the universal presence of tropical plants in the Coal-fields; just as it is assumed that the earth was once invested with a coating of ice, for the only purpose of explaining the mineral drift occasioned by the General Deluge; and this, too, when Geology avows that the earth was cooling down from its assumed molten state to its present temperature, somewhere about the time of the exalted heat demanded by the tropical plants of the Coal-formations. (See Appendix II.) Although it is superfluous to quote Theoretical Geology upon this subject, it is interesting to listen to its own language, which is so indicative of our diluvian theory. Thus

it is said by Sir CHARLES LYELL, in his *Principles of Geology*, that—

"It is from the ancient coal deposits that the *most extraordinary* evidence has been supplied in proof of the former existence of an *extremely hot* climate in those latitudes which are now the temperate and cooler regions of the globe." But Sir Charles has no difficulty with this problem, or that in relation to darkness; for he invents a special law of organic nature to sustain this particular assumption. Thus he says that—"We must not forget that the coal-plants were of perfectly distinct species (from those now living), and may have been endowed with a *different constitution*, enabling them to bear a greater variation of circumstances."

And thus BAKEWELL, in his *Geology*—"It is truly deserving attention, that the vegetable fossils found in distant parts of the world, and under very different latitudes, are *nearly identical* with those in the European Coal-fields. The plants in the Coal-fields of North America, and even the specimens from Greenland, are analogous to those in the English Coal-fields; and the few specimens that have been obtained from the tropical regions in America, from New Holland, and from India, belong to the same families as those which we find in the coal-strata of Europe. Now if we admit these distant beds of coal to be of contemporaneous formation, we must admit, also, that the temperature of the whole globe was, at that epoch, nearly the same in very different latitudes; or, were we to suppose that these Coal-fields were formed in different epochs, we must still grant that northern latitudes have once enjoyed the same temperature as countries under the equator." Such is the universal doctrine in Theoretical Geology.

It is interesting to observe the manner in which a Providential Design is made to issue from the devastating forces which are said to have brought about the Coal-formations. Thus, the Rev. Dr. BUCKLAND, in his *Bridgewater Treatise on Geology*, after saying that "The gigantic calamites, the stately lepidodendra, and sigillariæ, were *torn away by storms and inundations* of a hot and humid climate, and transported to some adjacent lake, or estuary, or sea, and buried in the detritus of adjacent lands"—remarks in another place, that, "However remote may have been

the periods at which these materials of future beneficial dispensations were laid up in store, we may fairly assume that, besides the immediate purposes effected at or before the time of their deposition in the strata of the earth, an *ulterior prospective view* to the future uses of man *formed part of the design* with which they were, ages ago, *disposed in a manner so admirably adapted to the benefit of the human race.*"

Geologists have also associated with the Coal-fields, as evidences of design, the occurrence of beds of iron ore in the strata of slaty clay that alternate with the beds of coal, and the limestone that serves as a flux. Even BAKEWELL, with all his "torrents of water," "upheavals and submersions," when writing from his "Easy-Chair," can not forego, for the benefit of the doctrine of violent causes, an expression of admiration when contemplating the obvious designs manifested by the Coal-formations. Thus—

"Before concluding these observations," he says, "it may be permitted to remark, that, however ancient the formation of coal and iron-stone may have been, the frequent occurrence of these minerals together, both destined in future time to give to man an extensive empire over the elements, and to contribute largely to his means of civilization and comfort, can not fail to impress the reflecting mind with evidence of prospective Designing Intelligence."

And to the same effect the distinguished theoretical geologist, the Rev. Mr. CONYBEARE—all of which the reader will naturally ascribe to an event that was not simply under the blind forces of inorganic nature:

"The occurrence of the *most useful of the metals*," says Conybeare, "in immediate connection with the *fuel* requisite for its reduction, and the *limestone* which facilitates that reduction, is an instance of *arrangement* so happily suited to the purposes of human industry, that it can hardly be considered as reasoning unnecessarily to final causes if we conceive that this distribution of the rude materials of the earth *was determined with a view to the convenience of its inhabitants.*"—*Geology of England and Wales.*

All this is the more remarkable, considering how the origin of the earth is handed over to Pluto, and the creation of the organic kingdom to the inorganic (Chapters VII. and VIII.). But as no

one will surmise that the tempests, &c., to which Theoretical Geology refers the Coal-formations were miraculously instituted, but were owing to purely natural causes, the results would have been equally a natural consequence, and not in the least an emanation from Design. But it will soon be rendered obvious that what are thus supposed to have been the results of Design could have never been effected by the causes to which they are assigned. Our Authors also, like many others of the same geological faith, have regarded with astonishment the methodical condition and the inestimable uses of the Coal-fields, when contemplating the reckless nature of their supposed causes. They could not resist the evidences of Design when contrasted with what their premises would inculcate; and I have thus availed myself of this testimony in behalf of the Noachian Flood, whose scheme was overflowing with Designs, and under the immediate superintendence of the Creator.

Without the interpretation supplied by the General Deluge, the origin of the Coal-fields, and their so-called "enigmas," would be an impenetrable mystery; and although many of its most important events were under the immediate direction of Providence, yet, as I have endeavored to show in Appendix II., there was no such interposition beyond the exigencies that demanded it. All else was delegated to natural causes, and the Coal-formations were one of their united results. There was, therefore, no immediate Design attending them, but, as will be shown, they were a necessary consequence of the Designs for the institution of the universal debacle. The waters simply deposited the vegetable material, and occasioned the interposition of the ferruginous, calcareous, and other mineral strata, according to the positions in which they had been placed by antecedent causes, and as will be soon described. But none shall say that this vast miraculous event, instituted for the general extermination of the human race, was not so ordained as to have embraced a countervailing result that should bear its testimony to all future generations, that the desolating catastrophe was designed in Infinite Wisdom and Goodness. Here is afforded an interpretation of the supposed designs manifested in the Coal-formations which reason may sanction; while, on the contrary, it revolts at the hypothesis which supposes that a stupendous system of spe-

cial designs was owing to the reckless fury of tornadoes, submersions and upheavals, alternated by a luxuriant vegetation pervading the whole earth—as well at the poles as at the equator—and lasting through a million of years, with the help of that most unscientific condition of things, a universal tropical temperature to be quickly succeeded by that equal paradox which has given rise to the "glacial theory."!!

We will now advance to our more specific objects. As a necessary effect of the sudden organization of the globe, which I have endeavored to establish by undoubted facts (Appendix I.), there would have not only occurred, as we have seen, an early eruption of the great mountain ranges, but the earth would have become progressively, though early, studded over with hills, many of which, until projected upward, were covered with water, as denoted by aquatic fossils. Nevertheless, it is in no respect necessary or useful to us to look beyond the present facts for our purposes. It is sufficient that the mountain-ranges, subalpine cliffs, and minor elevations bearing sedimentary deposits, existed, as now, at a period anterior to the General Deluge; and from the overwhelming nature of that catastrophe, it will be easy to show that multitudes of hills composed of the early detritus were levelled to the surface. The abundant creation of aquatic animals on the fifth of the Mosaic Days explains the appearance of testaceous fossils on the summits of lofty mountains, and the rapid multiplication of the same animals answers for the greater abundance in hills of a somewhat later date. And from what we have seen of the rapidity with which much of the sedimentary strata advanced at the earliest age of the earth (Appendix I.), we are amply supplied with hills composed of sedimentary deposits of sand, ferruginous earthy matter, clay, &c.; all of which, so far as we are now interested, were upheaved antecedently to the Flood and to the formation of the "tertiary strata." I may add, also, that I agree entirely with Theoretical Geology that the General Deluge could not have produced the regular formations which compose the crust of the earth, and therefore as it regards this question we may dismiss it from our present contemplations. (See Appendix I.)

It is another important element of our subject that, as we have seen, until the invention of the "Glacial Theory," it was consid-

ered a well settled fact that the Flood had its rise in southern regions, and advanced to the north-westerly, while the recession of the waters was in the opposite direction. It was also supposed that the southerly and easterly course of the boulders denoted a more violent movement of the waters when they retired from the dry land than during their invasion. Nor was the conclusion as to the irruption of the waters in the southern hemisphere at all founded upon the Coal-formations; and we have therefore the advantage of this corroborating testimony.

We have already had before us the proofs accumulated by Theoretical Geology, particularly by the Rev. Dr. BUCKLAND in his *Reliquiæ Diluvianæ*, of the universality of a Flood and of its overpowering violence; to which I will now add the following summary, by Sir CHARLES LYELL, of the conclusions which were founded by Dr. Buckland upon the facts which were embraced in that celebrated work. It is said by Sir Charles, that—

"By Dr. Buckland the Deluge has been represented as *a violent and transient rush of waters*, which tore up the soil to a great depth, excavated valleys, gave rise to immense beds of shingle, carried fragments of rocks and gravel from one point to another, and during its advance and retreat strewed the valleys, and even the tops of many hills, with alluvium." In that work Dr. Buckland affirms that "The discoveries of modern Geology, founded upon the *accurate observation* of natural phenomena, *prove to a demonstration* that there has been a universal inundation of the earth."

That "demonstration" was held to be conclusive till the invention of the "Glacial Theory," when it was suddenly abandoned for the greater novelty. I have therefore given to the subject a critical examination in Appendix II., in connection with other evidences of the Noachian Flood; and having there brought the boulders and other associated drift as living witnesses of that general catastrophe, we may now consult the Narrative itself, where we shall find that the rapidity with which the waters are said to have "*returned* from off the earth" shows particularly the violence of their recession, and thus harmonizes with the distribution of the boulders; while the time occupied by the rise of the waters, according to the same authority, equally denotes their more gradual progress, and thus explains

the limitation of their ravages to the overthrow of the forests and the deposition of the material upon a near level with the ocean. But the Scripture statements are so remarkable for exactness, we will have some of them before us. Thus it is said that "The waters prevailed upon the earth a hundred and fifty days," while in seventy-seven days afterwards, or, "In the seventh month and seventeenth day of the month the Ark rested upon the mountains of Ararat"—besides other corresponding statements relative to the dove and the raven, which alike declare a rapid and violent recession of the waters—the Ark, as we have seen, being particularly cared for either by a direct interposition of Providence, or by a sheltering afforded by the mountains—for the inspired Penman is careful to say that "God remembered Noah and all that was with him in the Ark."

From what has been now said of diluvian drift, it is not intended to be implied that all which is observable upon the surface of the earth is referable to the Noachian Flood. Very far from it; though I recognize no "geological deluges" as concurring causes. Great accumulations, however, of gravel, sand, and rolled stones may be traced to ancient lakes, deposited either in their beds, or wafted over the neighboring country when the barriers gave way. It is also evident that many other local accumulations of mineral substances owe their origin to the disintegration of mountains and the overflowing of rivers, some of which were antecedent to the Deluge, and others have been in progress ever since. But these are of a *local* character, while the drift of the Deluge is *universal.* The former can never be confounded by the practised eye with the latter, which are spread out upon an unlimited surface, or accumulated in hills, remote from mountains, lakes, and rivers. But to the Noachian Flood belong, in a general sense, the large boulders, or "erratics," and the scratches. Of the latter it is said by Prof. SILLIMAN, in his Appendix to *Bakewell's Geology*, that—

"The existence of scratches and furrows upon many rocks, *probably upon all* when the diluvium is first removed from them, appears to prove that they have been subjected to movements of heavy bodies passing over them." "The *direction* of these scratches on *this continent*, as well as *in Europe*, is such as to give the idea of a *current or irruption from the North.*"

With these premises, I proceed to say that the necessary result of the Flood would have been an uprooting of all the forests of the globe; and at that era the earth must have been generally covered with heavy timber.* The tropical regions were, doubt-

* Sir CHARLES LYELL produces, as a principal objection to the Narrative of the Flood, the *olive-leaf* brought to the Ark by the dove. He says that "It is clear that they who are most desirous of pointing out the coincidence of geological phenomena with the occurrence of such a general catastrophe, *must not neglect one of the circumstances connected with the Mosaic History, least of all* so remarkable a fact as *the olive* remaining standing while the waters were abating."

The defenders of Revelation have no disposition to evade the statements in the Narrative of the Flood, any more than they have in that of Creation. But they insist that those of the latter shall be received in the same literal sense, and argued accordingly, which Theoretical Geology requires in relation to the Flood. As to the olive leaf, it is sufficient to say that many trees must have been protected by the ravines and notches of mountains, and that, if denuded of their foliage, a new crop of leaves might have appeared within a very few days after the tops of the trees or shrubs had emerged from the waters. This will become more evident on considering another objection that has been often made, that "the tops of the mountains were seen only on the tenth month." Whereas the statement is, "In the tenth month were the tops of the mountains seen." But it does not follow, therefore, that they might not have been seen at a much earlier time, or, according to my interpretation, at any period of the Flood. From the surrounding context the statement appears to be of that precise, final nature, which is, as we have seen (Chapter XIV.), so conspicuous in the delay of all special allusion to the sun, moon, and stars until the fourth day of Creation. But we come to a fact which shows that this interpretation is right, and which corresponds with that which I have made of the statement that the waters prevailed, on an average, "fifteen cubits upward;" that is to say, "The Ark rested in the *seventh month*, on the *seventeenth day* of the month, upon the mountains of Ararat." Here, then, it appears that these mountains could have been, and undoubtedly were seen at least two months and a half before the supposed time; and if, as appears in another place (Appendix II.), the Ark rested upon the base of the two adjacent mountains, it is in the highest degree probable that the waters had not been at any time *accumulated* upon their tops, but only moved interruptedly over them. Such, also, will be made to appear of the summits of all other lofty mountains. The two mountains of Ararat are also so limited that they would not have afforded that resistance to the waters, either at their rise or subsidence, by which they were accumulated to a greater height and more permanently upon ranges of mountains. This, also, makes another provision for our much-needed olive, or whatever plant it was; for it may have been flourishing within the region of vegetation, either between the two mountains or on their southerly side, during the entire period of the Flood.

We find, also, in what is said of the birds a confirmation of our premises. The waters had not wholly "retired" when the dove was sent forth at the beginning of the tenth month. They had been decreasing more gradually since the seventh month, in consequence of a vast removal of their superincumbent pressure; but their recession still went on rapidly, for in seven days after the first mission of the dove the bird brought in the olive-leaf, and in seven days more, "she returned not again to

less, one universal forest. Such, indeed, is an important fact in Theoretical Geology; and not only so, but it clothes the arctic regions with a tropical vegetation. Its gigantic growth is also generally presented forcibly to the imagination in aid of the "carboniferous era;" and, to invent still farther a sufficient supply of vegetable material, and to aid in expounding the universality of the Coal-fields, an atmosphere of carbonic acid gas, as we have seen, is made to enact a conspicuous part in geological science. Just in proportion, however, as the growth of plants was vigorous, the assumption of a carbonaceous atmosphere is so much the greater violation of a principal law of organic life as it respects the vegetable kingdom; while the admitted contemporaneous existence of animals renders the hypothesis ridiculous. Air-breathing Serpents are said to have been "the Lords of Creation" at that particular epoch. But Theoretical Geology is entitled at all times to speak for itself. No better authority can be consulted than the "*Typical Forms and Special Ends of Creation*" (1856), by the Rev. Dr. McCosh and Dr. Dickie:

"We can not doubt," says the *Typical Forms*, "that the plants composing the earliest flora required supplies for their full development. In the vegetables of the carboniferous epoch we can recognize the existence of agents destined to perform an important part in the economy of those days. While able to obtain abundance of necessary pabulum to build up their organs and add to their carbonaceous ingredients, they were, at the same time, *preparing the way for the* ADVENT *of animals* by subtracting the excess of a gas noxious to animal life."

Brongniart, who, in his *Prodrome des Végétaux Fossiles*, introduced this hypothesis, employs the same language, supposing "a great excess of carbonic acid" to have been necessary to the growth of gigantic ferns, lycopodia, &c., and that the atmosphere was thus gradually prepared for animals.

Nothing, however, has appeared in the Coal-formations at all

Noah any more." And here we may see the truthfulness of this simple statement concerning the *dove* by comparing it with that relative to the *raven*, who "went forth to and fro until the waters were dried up from the earth," according to the natural independence of this bird; while the dove obeyed its own instinctive impulse of seeking protection in the Ark, and Noah acted in conformity to the instinctive movements of either. No Naturalist could have drawn a better portrait of the habits of these two birds.

comparable in size with the trees that are frequently seen in temperate zones, as on the Ohio River and in California; which settles the fact that there was nothing peculiarly conducive to the growth of plants at the "carboniferous era," but, on the contrary, that it was very much such an era as our own. Theoretical Geology is, therefore, environed with difficulties in providing the necessary vegetable material in the vicinity of the Coal-fields. But what thoroughly overthrows the assumed universal tropical vegetation, and supplies an insuperable proof of the General Deluge, is the positive necessity of sunlight without long interruptions, to any thing like a growth of plants exceeding the most inferior orders. Light is regarded, indeed, in the now prevailing doctrine of "Correlation or Equivalence and Conservation of Forces," as not only the vital force of plants, but, through that medium by which it is treasured up, as the Vital Principle, and the source of Mind, in man and animals. Now Coal-fields exist at Melville Island, in the Arctic Ocean, whose only vegetation at present is moss and weeds; while the coal embraces the usual tropical plants. Nor will it be credited that, however exalted may have been the ancient temperature of its climate, but with nights prolonged for three months, it could have ever yielded a growth of plants of much higher rank than mosses and lichens.* But it is innate with Theoretical Geology to prefer darkness to light. It began by rearing its fossilized plants and animals during those long ages of darkness which it assumed to have intervened between "the beginning" and the creation of light; and in endeavoring to escape from that dilemma by prolonging the Mosaic Days, it neglected the alternations of *long periods of darkness* which formed the nights of those imaginary days. (Chapter XIV.) Another insuperable objection to the hypothesis of a tropical vegetation, and which absolutely proves the transportation of the tropical plants from equatorial regions, is the fact that the exuviæ of such plants are nowhere found outside of the torrid zone, excepting in the Coal-formations.

* Dr. HAYES, the Arctic explorer, stated at a meeting of the *American Institute of Science* (April, 1870), that—"Among other matters of scientific value, I discovered extensive beds of coal in Greenland, showing how different, in a former geological epoch, must have been the climate." It is also lately ascertained that Alaska abounds with coal.

Among our most natural inquiries is that of the ultimate disposal of the inconceivable amount of vegetable matter which must have been prostrated by the Flood, if such an event have happened. Where is it? What has become of it? Assuming an ignorance of the existence of the Coal-fields, and the probability of the Flood, our premises are such as to render it certain that no small proportion of the uprooted forests must have been entombed in the earth, probably beneath the diluvial mineral drift; or if nowhere found, the General Deluge would be greatly discredited as wanting in one of its indispensable results; and all the other stupendous proof of its occurrence—the sublime dimensions of the Ark, the mineral drift, all the inspired knowledge of the Prophet and Apostles, the tradition of the Jews and of all nations, our Lord's confirmation of the event—would confound us with astonishment, and the triumph of the "Glacial Theory" would be our climax of confusion. As it seems probable, therefore, that when the diluvian waters receded they deposited their mineral drift upon the masses of vegetable matter which must have been left upon the surface of the earth at the rise of the waters, we are surprised, on digging down, that it is not there! But a little reflection satisfies us that it has probably been accumulated in masses and limited localities by the obstacles it encountered in hills and mountains, and that therefore it must be the work of time and accident to detect the isolated spots. At last it comes! And we find it, in correspondence with our anticipations, imbedded in materials native to the localities. Revelation triumphs, and Theoretical Geology falls before it. This, however, is only the groundwork of our proof.

But how were the forests accumulated so generally upon a level with the ocean when nothing but hills could have arrested their onward movement; and often no hills are seen over an extensive area to expound the phenomenon? This, indeed, must be very embarrassing to Theoretical Geology in its pursuit of those mineral strata which the land only can supply. But all this is exactly what our diluvian theory demands. It requires these hills not only as an obstacle to the drift of the flood-wood, but also for their demolition to supply the material of the mineral strata. We have seen that, as they were evidently thrown up at an early age of the earth, the low places which are occu-

pied by Coal-fields were, doubtless, thickly studded over with them. (Appendix I.) The basins or valleys in which the deposits were made, as well as the mineral strata, render it certain that such elevations existed, and the abundance of the "dikes" and "breaks, or faults," equally confirm the fact, as will soon appear. There has, therefore, been *a cause* of the general abrasion of these hills; and as there could have been no other of such a common phenomenon in its connection with the Coal-basins than a universal flood, the disappearance of the hills from above the surface of the ground is another immense proof of that catastrophe, and scarcely less so their remains beneath the surface in the aspect of "dikes," and which are among the most troublesome "enigmas" to Theoretical Geology. We are thus, also, supplied in these hills with all the requisite material for the mineral strata, so only we can adjust them rightly.

But as Theoretical Geology will object to these hills, notwithstanding our facts, we must interpose its own premises. How, therefore, I ask, does Geology, upon its own hypothesis that the Coal-fields were deposited in estuaries, lakes, and valleys, obtain the strata of sand and clay but from the very hills to which we refer them, and from which it gets its supply of vegetable material? True, it is especially embarrassed as to those strata; but coming to such as consist of limestone and the fossiliferous, it has the very summary method of resorting to "submersions beneath the ocean and upheavals," in the numerical ratio of the mineral and coal strata that make up the deposit.

I proceed, therefore, to say that, such was the accumulation of forests, they must have overturned, more or less, every unconsolidated hill of the secondary class which they may have encountered by their collisions. If the torrent of water alone, when returning from the earth, was capable of crumbling the tops of granite mountains, and everywhere transporting massive boulders and other ponderous mineral drift to distances which astonish the contemplative mind, nay, of simply uprooting the forests, what should have been the effect of immense accumulations of trees, urged on by such an impetuous force, when encountering hills of unconsolidated materials? And here it is important to consider that the arenaceous, argillaceous, and other material of the mineral strata of the Coal-formations did not exist in a solid-

ified state, but simply in the condition of sand, clay, ferruginous earth, plastic limestone, &c., the last of which is still found soft at the bottom of lakes, with or without imbedded shells; and this is as necessary for Theoretical Geology as for ourselves. Indeed, such was the soft condition of all the sedimentary strata of the earth when brought into their present position; and although I have argued that subject upon the ground of its having consisted to a large extent of the detritus of the primary rocks, the presumption is strong, especially on account of the density of the strata and the rapidity with which they were formed, that a large proportion of what is not referable to an oceanic source consisted of the loose material which resulted from the organization of the globe, and which was at once sufficient for the purposes of organic life. (See Appendix I.)

And now a word as to the fossiliferous strata, especially when those of *salt* and fresh water occur, as they sometimes do, in the same Coal-field, forming one of the greatest "enigmas" in Theoretical Geology. In this embarrassing case, Geology sees no expedient but that of resorting to marine "submersions and upheavals," as far as demanded by the salt-water strata, and, for the fresh, substitutes, at intervals, "submersions and upheavals in fresh-water lakes." [!] On the contrary, how simple the solution supplied by my diluvian theory. In these complex instances the vegetable matter had been deposited in estuaries of the sea and in neighboring lakes, in the former of which fossiliferous limestone had been elevated or washed up into hills, and in the latter the like material of the fresh-water strata. The Deluge scooped out their waters, deposited its burden, laid the basins of water into one, and, as will be shown in the sequel, the impinging torrent, with its battering forest, completed a phenomenon which has been as much "a mystery of mysteries" to Theoretical Geology as "organic life." Where the fossiliferous limestone is purely oceanic, or derived from fresh water, Theoretical Geology, without regarding the presence of other mineral strata, supposes that the vegetable material was deposited either in estuaries of the sea or in fresh-water lakes. It then proceeds to expound the fossiliferous strata by "submersions and upheavals of the Coal-fields," but supplies no information as to the source of other accompanying strata, such as arenaceous, ferruginous, &c.

We agree, however, with Theoretical Geology in supposing that in these cases the vegetable matter was deposited, in a general sense at least, either in lakes or in estuaries of the sea, though not at all as to the manner in which the fossiliferous limestone was deposited over the strata of coal. When the vegetable substance was accumulated, the limestone and the material of the other mineral strata existed in the form of hills, which, when overturned by the impinging forests, simultaneously supplied, as will be seen, the material for the mineral strata. These hills being more or less immersed in the estuaries or lakes, their plastic condition was more perfectly preserved. This interpretation embraces not only the common limestone, but the secondary magnesian or stratified dolomite, about which Theoretical Geology has many perplexities, particularly the coexistence of fossil exuviæ, and some of the metals in the stratified variety of dolomite. Whatever foreign matter, whether metallic, or consisting of fragments of primitive rocks, may be embraced in the limestone strata, they must have been washed in from the surrounding land.

Our diluvian theory has no difficulty with the fossiliferous strata; while in a general sense the hills of the dry land yielded the other mineral substances, and probably, also, more or less of the fossiliferous limestone, as the collisions took place; and the crumbling of the hills would have been farther promoted by the valleys at their base. The valleys received the vegetable mass when the undulations of the waves receded, and the earthy material, simultaneously precipitated from the hills, would have effectually prevented a disturbance of the deposited forest at the next encounter. Hence it is that the Coal-fields lie in valleys or "basins." And here it is that we meet with those ruins of the antediluvian world mingled together — hills prostrated, forests imbedded. But vast as are the Coal-formations, they are far from being commensurate with the then existing vegetation. A proportion was devoted to the ocean; nevertheless, as the rise of the Flood was from the south-east, it is evident that a greater proportion would have been deposited upon land.

Such, also, are our premises, that the grand commingling of hills and forests should have occurred upon the lowlands, where the latter met the first obstacles; and this conclusion is sustained

by observation. "The regular, or great Coal-formation," says one of its principal expounders, "has never been discovered *above the level of the sea.* It is generally found *towards the feet of great mountain-chains*, or in valleys near the lofty mountain-ranges." And so, also, another—"The strata of the great Coal-formation," says Bakewell, "seldom attain any very great elevation, the *principal Coal-districts* being situated near the *feet of elevated mountain-ranges.*" This is true, however, only in a limited sense; much of the vegetable mass having been arrested and deposited before reaching "the feet of the great mountain-chains;" although, as will be seen, these lofty chains, however distant from the hills that arrested much of the floating material, contributed more or less as an obstacle to its progress.

The hills that were overturned and now appear in the condition of mineral strata in alternations with others of coal, would have been more or less an inadequate obstacle to the advancing flood-wood without some co-operation from the mountain-ranges; while such of it as surmounted these low barriers was firmly arrested by the lofty chains. And here the reader may comprehend distinctly the manner in which the waters must have been so accumulated as to have partially submerged the tops of high mountains, taking for our guide the average Scripture measurement of "fifteen cubits," or about twenty-seven feet. This explanation, I may remark, of what must have occurred reconciles perfectly the statements of the Narrative. The waters were rushing with greater violence than our swiftest rivers; and if we imagine the effects of a dam across the Mississippi when charged with a surplus of water, as in freshets, there will be no difficulty in realizing the altitude of the waters when they were arrested by such a range of barriers as the Rocky Mountains, and how extensively and deeply must have been the consequent inundation of the country on the southerly and easterly aspect of such ranges. An ordinary mill-dam supplies a clear illustration. The same consequences would have attended the recession of the waters as it respects the northerly and westerly face of the mountains; and from its greater violence than the rise, the necessary result would have been a dislocation of the boulders from the summits of mountains, floating and tumbling over extensive regions. Theoretical Geology has hitherto laughed at the fifteen

cubits of water when turning its attention to "all the high hills under the whole heaven." Nay, more: had the Inspired Writer intimated that all the high hills were not covered, in connection with the statement of the average depth of fifteen cubits, it would sooner or later have seriously affected the credibility of the Narrative. And considering, also, the incredulity of Theoretical Geology as to the submersion of all the high hills, and how much more likely twenty-seven feet of water would have appeared to Moses as a greatly inadequate quantity, the statement must be received as a strong corroborating proof of the Divine Revelation of the entire Narrative in all its verbal particularities.

We thus learn how the mountain-ranges were instrumental in the formation of the Coal-fields, even where they are separated by great distances. Their resistance of the force of the torrent contributed largely to the deposition of the flood-wood in the valleys and other regions below; since these lofty barriers, by staying the current, added to the resistance of the lower hills, and the waters being now immensely accumulated, the forests should have been carried backward as the waves receded. Hence, also, in a general sense, the Coal-fields should lie on a southerly or easterly face of high mountain barriers; while, on the other hand, according to the geological hypothesis, they should have equally occurred on all sides. Nor should the coincident proof be neglected in this connection, that the boulders and other associated diluvial drift should occur on all sides of mountains, according to the glacial or any other than the diluvial theory; while, like the Coal-fields, they occupy the requisite position on the southerly and easterly aspect of the mountains in all countries. (See Appendix II.)

Still, it should be considered that the Deluge would, in all probability, have sometimes accumulated vegetable matter from the northern aspect of lofty mountains in sufficient abundance to have formed some minor Coal-fields in that direction; especially where the ranges are not a continuous, but broken barrier, or when they may run in a northerly and southerly line. Our diluvian theory would also prompt the conclusion that the westerly coast of South America, Australia, and the islands of the Pacific Ocean, would have furnished some materials for coal on

the westerly regions of the Rocky Mountains. It would also render it probable that we should sometimes meet with small localities of coal upon even high mountain-ranges; especially within the tropics where vegetation is most luxuriant. Such is known to be the fact. But how will Theoretical Geology expound this phenomenon in conformity with its local torrents of water, especially where coal presents itself upon lofty regions that are admitted to have been elevated long anterior to the "carboniferous era;" such, for example, as is reported by Humboldt to exist at Santa Fe de Bogota, at about 8700 feet above the sea, and, as is said by others, at the height of more than 14,000 feet, near Huanico, and near to the region of perpetual frost?

The foregoing exceptions point to the General Deluge as the only key that can open the way to these, as it does to the various other unexplained phenomena of the Coal-formations. As to any extensive deposits which are found upon hills, they have been elevated since the era of the Flood, as seen in the Pennsylvania anthracite Coal-fields. That these regions have been lifted up subsequently to the "carboniferous era" is as necessary to Theoretical Geology as to our diluvial theory, and it is farther shown by the disturbed condition of the strata, and by the conversion of the bituminous into anthracite coal by the agency of the volcanic heat requisite for the upheaval; and which will be seen, also, to be fatal to the hypothesis of "submersions and upheavals," since all the Coal-fields which Geology subjects to convulsions to obtain their calcareous and fossiliferous strata would have been equally disturbed and deprived of their bituminous matter.

I shall now introduce some examples of the effects of earthquakes, to enable the reader to clearly apprehend what would have been the general effect of "breaking up the great deep" (not improbably in part by the irruption of the newly discovered continent in the Antarctic region), and how it would have established a wave-like current which the vegetable drift supposes. Our illustrations consist of instances where the bottom of the ocean was slightly disturbed in recent times, and over a small extent only. When Lisbon was destroyed by an earthquake in 1755, Cadiz was also severely shaken.

"About an hour after," says a writer from the latter place, "on

looking out to sea, we saw a wave coming, at eight miles off, which was at least *fifty feet higher* than common. It came against the west part of the town, which is very rocky, and the rocks abated a great deal of its force. At last it came upon the walls, and beat in the breastwork, and carried pieces of *eight or ten tons' weight forty and fifty yards* from the wall, and carried away the sand and walls. When the wave was gone, some parts that are deep at low water were *quite dry, for the water retired with the same violence it came with. These waves came in this manner four or five times.*" Another writer gives the same account.—*London Philosophical Transactions*, vol. xlix., 1755.

Bakewell, in describing the effects of earthquakes, has exactly parallel examples. Thus, in his Geology—"Towns situated on the coast, and nearly on a level with the sea, frequently experience the most destructive effects from a sudden rise of the water during earthquakes. An immense wave is thrown with much violence over the houses, and on retiring carries with it the ruins left by the earthquake, and scatters them on the coast, or deposits them in the ocean. The wave *retires with great violence, and returns again until the equilibrium is restored.*" Illustrative examples are then stated in the destructive effects of the earthquake on the coast of Chili, Feb., 1835.

Again, it is remarked by LYELL that "Professor SEDGWICK is inclined to adopt the hypothesis of M. Elie de Beaumont, that the sudden elevation of mountain-chains 'has been followed again and again by mighty waves desolating whole regions of the earth;' a phenomenon which he thinks has '*taken away all anterior incredibility from the fact of a recent deluge.*'"—*Principles*, &c. Such, also, is exactly the opinion of the Rev. Dr. Buckland, as promulgated in his *Reliquiæ Diluvianæ.*

It is even said by the Rev. Dr. HITCHCOCK, that—"In inquiring whether any *natural* causes could have produced the Deluge, we have shown that, of the three hypotheses maintained in modern times on this subject, the sudden elevation of a mountain or continent by internal force is the only one that can be defended with any plausibility. *If these convulsions be admitted*, every reasonable man will allow that the Mosaic account of the Deluge STANDS FORTH FAIRLY AND FULLY VINDICATED FROM ANY COLLISION WITH THE FACTS OF SCIENCE. Nay, a *presumption* is here

derived in favor of the Mosaic account. We are aware that some will be disappointed if we do not go farther, and say that Geology strictly confirms the Mosaic history, as it has been customary to do in our popular treatises upon the Deluge. *But we prefer to take our stand on firm ground.*"—*American Biblical Repository*, Jan., 1838. (See *Note* at page 646.)

And so also Professor SILLIMAN, in his Appendix to Bakewell's Geology—"If the universal Deluge recorded in Genesis be taken as a type of diluvian action, and the time and the elevation stated in the history, as measured by existing mountains, be taken into the account, nothing could be more violent, destructive, and overwhelming; and certainly UPON THE FACE OF THE EARTH ARE EVERYWHERE RECORDED IN LEGIBLE CHARACTERS THE NECESSARY PHYSICAL EFFECTS OF SUCH A DEBACLE."

"These necessary physical effects," therefore, establish the fact of a universal Deluge, whether the Mosaic Narrative be admitted or not. But it is more than probable that what we shall have shown will appear to the unprejudiced a full confirmation of the Divine Authenticity of the Record, since by no possibility could its writer have gathered his information of the *universality* of the catastrophe either from geological research or from tradition; while also, as we have seen, he could have known nothing of the necessary dimensions of the Ark (Appendix II.), or of the testimony supplied by the Coal-formations. In these respects, all were upon common ground of ignorance when the Mosaic Narrative was written, whoever may have been the Scribe, or whatever its date. The remarkable limitation of the average depth of the waters to about twenty-seven feet, and the statement that "all the high hills under the whole heaven were covered," is a very conclusive internal proof of the Divine Revelation of the Narrative. Our demonstration shows that the average depth of twenty-seven feet of water was amply sufficient. But is it at all probable that the writer of the Narrative would have entered upon our calculation? On the contrary, would he not have been as well aware of the improbability of his story as is now represented by Theoretical Geology, had he not obtained his information from a perfectly reliable authority? After the several thousand years since the statement was promulgated, Theoretical Geology reaches the conclusion that—

"The mass of water necessary to cover the whole globe to the depth supposed would be in thickness about five miles above the previous sea-level, and this quantity of water might be fairly calculated as amounting to eight times that of the seas and oceans of the globe, in addition to the quantity already existing. The questions then arise, whence was this water derived, and how was it disposed of after its purpose was answered? These questions may, indeed, be met by saying that the waters were created for the purpose, and then annihilated. But we are not at liberty thus to invent miracles." — Rev. Dr. J. Pye Smith's *Scripture and Geology.*

Hugh Miller, in his *Testimony of the Rocks*, ridicules at great length the idea that Noah could have surveyed from the Ark the tops of "all the high hills under the whole heaven." But no such statement occurs in the Narrative; and it is also remarkable that what is said as to the hills is only an incidental circumstance, without any other apparent object than that of presenting an actual occurrence, but one of the least important contingencies of the Flood. Nor, probably, did the forty days' rain contribute at all to the requisite quantity of water, however much it may have aided in the destruction of life. It was only an incident of the breaking up of the great deep. While that was in progress, the spray arising from the lashing of the waters over the dry land would have necessarily kept the atmosphere densely charged with vapors, attended, as a consequence, with an universal avalanche of rain, as described in the expressive words, "The windows of heaven were opened." This has been a god-send to Theoretical Geology. "What!" says Geology, "create five miles' depth of water and empty it out of the heavens, and then be obliged to extinguish the enormous amount of eight times the present bulk of the seas and the oceans! Don't believe it! Science shows its absurdity!"

But it is all left to the faith of mankind, without a word of explanation; foreseeing, also, that the adverse speculations in Geology would ultimately lead to a development of the explanatory facts, and thus teach a lesson to Theoretical Geology that succinct statements in Revelation are most becoming the Deity.

As to the cause of the recession of the waters, we naturally infer, from the cause of their rise, that it consisted in the subsid-

ence of the bed of the ocean. This accounts, also, for the greater violence and rapidity of their subsidence than their rise, since in the latter case the water was *lifted up*, while in the other the same downward pressure increased in an incalculable degree the violence of their movement.

With the various premises which have been now presented, and taking along what has been said in Appendix II. of the rise and recession of the waters of the Flood, we readily obtain a solution of all the other "enigmas" which are destined to render Theoretical Geology conspicuous in the annals of criticism. The appearance of fossiliferous tropical plants, or their impressions, in most if not all the Coal-fields, even those of high northern latitudes, and of the same species as occur in the Coal-fields of the tropical regions, is a natural consequence of the profuse vegetation in so vast a quarter of the globe. Nor does Theoretical Geology manifest a proper respect for "science" in assuming that they were the growth of all quarters of the earth, whatever temperature it may assign to northern latitudes, since every great region would have had its own peculiar species, according to the analogies which now prevail, to say nothing of the effects of those nights of three months' duration which enshroud the Coal-fields of Melville Island. Local torrents of water would have accumulated those, and those only, in the vicinity of the several Coal-fields respectively; and Theoretical Geology admits that there has been no change in the vegetable world since the carboniferous era. Thus it is said by Sir CHARLES LYELL, that—

"In regard to plants, we may consider those which characterize the great carboniferous groups as the first deserving particular attention. They are by no means confined to the simplest forms of vegetation, as to cryptogamous plants; but, on the contrary, *belong to all the leading divisions of the vegetable kingdom.*" And thus PHILLIPS, in his *Geology*—"Plants and *animals* of the carboniferous system are conformable with the existing types, and intelligible by them." And so, also, Bakewell.

The following "enigma" interprets the universal diffusion of tropical plants in the Coal-formations. There exists near Cologne "a great repository of coal, which extends for many leagues, and is covered by a bed of gravel from twelve to twenty feet deep. Trunks of trees *deprived of their branches* are imbed-

ded in this coal, which *proves* that they were transported from a distance." And how great the distance, and how recent the transportation, is shown by the fact that "*nuts indigenous to Hindostan and China are also found in it.*"—BAKEWELL'S *Geology.*

And how can the hypothesis of local torrents of water stand, for a moment, an analysis of the Coal-fields which occupy but a few acres of the narrow limits of Rhode Island, where, according to a scientific and accurate observer, Dr. WM. F. CHANNING, "*Five hundred millions of tons* is not too large an estimate of the quantity of the Rhode Island anthracite coal."

Or, again, how will the geological hypothesis dispose of the Coal-fields in that other small island, Great Britain, without resorting to assumptions that carry their own contradiction, but which the forests of Africa explain at once on our diluvian theory? "The total thickness of the Derbyshire strata," for example, "including a part of Nottinghamshire, in which are *thirty* different beds of coal, is 3930 feet, of which seventy-eight consist of coal;" and here is another more complex example in that same small island, in which the extent and thickness of the strata of coal can be explained only by the forests of Africa. Thus it is stated, in *Bakewell's Geology*, that—

"It has been observed that Coal-strata are bent in concavities resembling a trough or basin, *dipping down* on one side of the field and *rising* on the other" (the sides of the valleys). "In the great Coal-field in South Wales, which is rather a *long trough* than a basin, the strata are arranged in this manner over an extent of nearly *a hundred miles in length*, and a variable breadth of from *five to twenty* miles. It contains twenty-three beds of workable coal. The thickest bed is nine feet. In some parts there are sixteen seams of iron-stone. The strata of this vast Coal-field are *deeply cut through by valleys*, and are much broken by faults." "It forms an extent of surface exceeding twelve hundred square miles; and it is computed that it will yield sixty-four million tons of coal per square mile," or an aggregate of 76,800,000,000 tons, or at the rate of 20,000,000 tons annually for nearly four thousand years.

The following are other illustrations of the same nature as the foregoing. It is stated that the "anthracite Coal-region of Pennsylvania embraces four hundred and seventy square miles, and

that the amount of *anthracite* coal yet in the earth (the area and thickness of the veins being accurately known) consists of 26,343,675,000 tons. From this deduct one-half waste in mining, there will be left of marketable coal an amount yielding 20,000,000 tons annually for six hundred years.

"Statistics of *bituminous* coal show that within a circle of one hundred miles, of which Pittsburg, Pennsylvania, is the centre, there is enough bituminous coal in the earth to pay off the national debts of all the governments of the world many times over. And it has been estimated from geological surveys, that this coal would pay the debt of the United States (near $2,500,000,000) fifty-four times, if its stupendous value could be realized at once"—a value amounting to $135,000,000,000.

Nor can there be desired a more satisfactory proof of our diluvian theory than what is supplied by the following quotation from PHILLIPS'S *Geology* (1855), relating to the supposed convulsions of the Coal-formations. Thus:

"This long period [of the Coal-formations] appears to have *come suddenly to an end*, and the regularity of its deposits to have been interrupted *by a general eruption of disturbing forces*, which have left traces of their power and extent *in all the Coal-fields* of Europe and America. As, after the deposit of the slates, violent dislocations happened, and were succeeded by the old red conglomerate, so, *after the deposit of coal*, similar and equally extensive interruptions of the planes and courses of strata were followed by the analogous deposit of lower red sandstone." "Scarcely a mine or colliery is worked in strata of this era *in any part of the world which is not crossed by several dislocations of this nature; and it is always found that they divide and displace in the* SAME DIRECTION *the whole series of the strata to the greatest depths which man has reached.*" "That these dislocations happened *after the complete deposit and induration of the Coal-strata is evident; that they followed almost immediately, and happened nearly at the* SAME PERIOD OF TIME *in all the coal tracts*, appears certain from the general fact that the disturbances rarely extend into the newer strata of magnesian lime and red sandstone."

I have marked in the foregoing quotation the particular circumstances which most deserve consideration, especially the supposed universal disturbing force, resulting in upheavals, though limited to the Coal-fields; its occurrence at the particular mo-

ment of the termination of the "carboniferous era," and the sudden termination of the long period of the coal deposits. These universal coincidences are entirely beyond any interpretation but that which is supplied by a cause like the General Deluge, while the phenomena are exactly such as the Deluge should have occasioned. After what has been already said of the requirements of our diluvian theory, the reader can not fail of recognizing in the "dislocations" or supposed upheavals, forming the dikes, the remains of those hills which had arrested the flood-wood, and around which the vegetable material was deposited; the dykes being thus limited to the Coal-fields. But with all this should be associated the contradictions by geological facts which will have been stated, as well as the various other "enigmas" which Theoretical Geology has delivered over to impossible causes.

The grand "enigma" relative to the interposition of the various mineral strata, including the fossils, and for the interpretation of which Theoretical Geology violates the existing order of nature and the plainest facts, is clearly resolved by the necessary result of repeated collisions of immense forests against the hills of sand, ferruginous earth, clay, &c., which had been either thrown up from the bottom of the sea or of lakes, or accumulated where the land had not been submerged. The mode in which the waters rose upon the earth would, as we have seen, have established a wave-like movement, and the recession of the waves would have been greatly increased whenever the flood-wood encountered the hills, and especially by any mountain-ranges in the distance. As soon, also, as the collisions took place, a part or the whole of the floating mass would have been deposited in the valleys; and then immediately the crumbling hills would have dashed down upon the vegetable mass and have been extensively diffused over it by the agency of the waters. All this will be readily appreciated when it is considered that vast mountain slides are often occasioned by a rain of a week's duration.* The number, depth, and extent of the strata would depend upon the frequency and size of the hills, upon the force of each collision, and upon the number of collisions that may have happened before the whole vegetable mass would have been arrested, or

* In the case before us—"*the rain was upon the earth forty days and forty nights*" —perhaps in part for this very purpose.

the hills more or less demolished. And so of the number, depth, &c., of the strata of coal. If the whole mass were deposited at once, then, of course, there would have been no interposition of mineral strata, but only the superincumbent. And who does not see in these solitary strata of coal, and the great thickness which they often present, a full contradiction of the hypothesis of slow formation, not only as contrasted with the numerous strata of other fields, but the absurdity of supposing that such a mass of vegetable matter could have been accumulated from the surrounding country by a *single washing?* for, had there been more than one, there should have been as many strata of coal and of the mineral substances.

Again, another "enigma" in the isolated strata of *leaves*, which no imagination can refer to any other source than an immense forest of trees simultaneously deposited beneath by a vast body of water; and which in itself, when taken in connection with the universal Coal-fields, conclusively establishes the General Deluge. These leaves, as their existence alone demonstrates, were forcibly detached from great masses of trees, and floated along with the forest, but particularly separated when the collisions took place. This detachment of the leaves should have often happened, and they should, as they do, have often formed isolated strata, since, floating upon the surface of the water when the collisions took place, the trees were first deposited, and the great mass of descending mineral substance would have been precipitated upon the trees before the receding waves would have deposited the leaves; when any continued descent of the earthy matter would have either involved itself among the foliage, or have formed a stratum above it. This is also exactly the variety which now meets our observation in Coal-fields widely separated from each other.

And again, another "enigma," which, like the rest, Theoretical Geology regards as paradoxical, is the *unbroken* condition of the leaves, and of the large and delicate fronds of various species of fern; and which, too, is equally as the foregoing conclusive in itself that no other cause than a General Deluge could have borne them so universally in this unmutilated state to their various resting-places. This conclusion would be incontrovertible were the occurrence less generally apparent; but it must be-

come undoubted with every unprejudiced mind in view of the universality of the fact. The phenomenon is represented in the following manner by Professor Silliman, in his Appendix to *Bakewell's Geology:*

"Among the plants of the Coal-formation, situated sometimes hundreds and thousands of feet below the surface, and covered by many beds of solid rocks, their leaves, many of which are of the most tender and delicate structure, are often found fully expanded, *in their natural position in regard to the rest of the plant*, and laid out with as much precision as in the *hortus siccus* of a botanist. It is often true that the *minutest parts do not appear to have suffered attrition or injury of any kind.*"

Flowers, also, as well as the most delicate plants, which Theoretical Geology has erected into a collateral "science" of "enigmas," have been thus transmitted to us from the antediluvian world through their incorporation with both the mineral and coal strata, receiving the significant title of the "fossil flora of the Coal-fields." And what a contrast is this with the hypothesis of Theoretical Geology, which, in its habitual disregard of physical impossibilities, refers, as we have seen, the vegetable accumulations to washings of the adjacent regions of country. Independently of the visionary nature of the assumption that an adequate supply of material could have been thus yielded, even for a single one of the thicker strata, and this, too, after each raking of the country, according to the number of the strata, by torrents of water capable of uprooting and transporting forests, I need not farther point out the impossibility of the existence of the "fossil flora," "the beautiful fronds of ferns," &c., upon the geological premises, since every leaf, every flower, every delicate plant, would have been torn into fragments, and mingled with the general mass. Associated, also, with this are the great "enigmas" relative to the torrents of water, their universality in respect to the Coal-fields, their limitation to those particular spots and to a level with the ocean, their contemporaneousness with the "carboniferous era," and their abrupt disappearance forever from the earth as soon as they had accomplished the work of the Coal-formations, and the greater "enigma," also, that they should have perpetuated such a memorial of a tropical growth of plants in the dark region of the frozen zone, and the sudden cessation

of this wonderful vegetation as soon as the Coal-fields were finished off; and outside of the tropics *found only in Coal-fields.*

Still another so-called "enigma" presents itself in the perfectly distinct positions of the mineral and coal strata; when, upon the geological hypothesis, these torrents of water should have hurled down rocks and earth, and mingled them in one mass of confusion with the vegetable material; and this, too, with the necessity of supposing that the land was desolated in vegetation, and divested of its soil and seeds, at each successive and most unaccountable flood of water. And yet it was at these desolated spots, and nowhere else, that not only the torrents continued to reappear, but vegetation to advance in its unwonted vigor. Geology looks on in astonishment, and surmises that this violation of the order of nature was in anticipation of the appearance of man upon the globe.

"The trees of the primeval forest," says the Rev. Dr. BUCKLAND, in his *Bridgewater Treatise on Geology*, "have not, like *modern trees, undergone decay*, yielding back their elements to the soil and atmosphere; but, *treasured up in subterranean store-houses*, have been transformed into enduring beds of coal, which in *these latter ages have become to man the sources of heat, and light, and wealth.*"

But why not "undergo decay like modern trees?" Theoretical Geology shows us nothing by which we may conceive of the abrupt cessation of the laws which had governed the vegetable kingdom antecedently to the Coal-formations, and their equally sudden and undisturbed restoration according to the laws originally ordained, or of the marvellous torrents of water. And here Theoretical Geology, in respect to the causes which it assigns for the Coal-formations, brings up a fact which completely overthrows its hypothesis in all its assumptions; for by no possibility could the vegetation of its long "carboniferous era" have been maintained in the particular spots of the Coal-fields, unless the "primeval forests" had continued, during that supposed era of luxuriant growth, to "*undergo decay like modern trees, and to yield back their elements* to the soil and atmosphere by which they had been nourished." The blunder is as great as that of placing the Coal-formations in long periods of darkness, or of providing for them an atmosphere of carbonic acid gas.

It is also remarkable that it has not occurred to Theoretical Geology that it places the "carboniferous era" at a period of time when it assumes that immense regions where the Coal-fields exist were at the bottom of the ocean! "We are all brought," says Dr. BUCKLAND, "into immediate connection with the vegetation that clothed the earth *before one half* of its actual surface had yet been formed." [!]

But let us grant to Theoretical Geology the requisite seeds and soil for every successive crop of vegetation, and it will be equally confuted upon this ground; for it would necessarily imply the growth of new species of plants after every ploughing over of the earth, just as the burning of forests is succeeded by other species, or as the earth is now generally clad with a vegetation different from that of the "carboniferous era;" whereas the Coal-fields, from top to bottom, are everywhere composed, in a general sense, of the same species of plants. This is required by our diluvial theory; and not only so, but a total absence of such a jumble of rocks, earth, and coal, as the supposed torrents of water would have occasioned; and yet there should be an intimate intermixture of earthy matter with the coal arising from the turbid condition of the water, and the percolation through the vegetable mass of earthy matter from the prostrated mineral strata. Occasionally, also, a denser mineral drift would have been likely to have become involved in masses of the vegetable substance, and to have been deposited with it. Such, too, are the realities; and had it been otherwise, it would have been indeed an "enigma." The cast-off blendings of earth and coal at the workings of the Coal-fields, and from our furnaces and grates, supply all the analytical proof that is wanted upon this subject.

Let us now hear Theoretical Geology in its troubled deliberations over the strata of leaves, and the unmutilated state of delicate plants. BAKEWELL, who was thoroughly practical, and withal a thorough advocate of the long geological eras, including the long periods of darkness which distinguished the vegetation of the Mosaic Days, the "remodellings of the earth," "extinctions," "new creations," "submersions and upheavings" of the Coal-formations, &c., but otherwise a man of facts and candor, remarks, that—

"Very thin seams of coal sometimes alternate with the shale

lying between two large beds of coal. I have on the table before me a mass from the Dudley Coal-field, in which parts of two beds of coal are separated by a stratum of indurated clay or shale, about *two inches* in thickness. This stratum of shale contains more than *twenty seams of coal*, none of which exceed the thickness of a wafer, but they are distinctly separated from each other by seams of shale. These thin seams of coal and shale were probably formed of *alternate depositions* of leaves or minute aquatic plants and of earthy particles forming layers of clay or sand."

Exactly so. The leaves or minute plants were borne upon the top of the wave, which, on its recession, deposited layers of this delicate foliage, one after another, in quick succession, by immediately subsequent undulations from the margin of the receding wave (as often witnessed by the sea-side); and a constant draining down of clay or sand from the hill, as the ultimate effect of the collision it had sustained, explains "the seams of indurated clay or shale." In consideration of the exigencies of the case, Bakewell apostrophizes in the following manner.

"These are circumstances which appear to me to *prove* that the formation of the Coal-strata was effected *more rapidly* than those Geologists have hitherto been willing to admit who have only examined Coal-mines SEATED IN AN EASY-CHAIR IN THEIR STUDIES."

This is what I say. And what candid mind, knowing the habits and pursuits of the most zealous in Theoretical Geology, will doubt for a moment that all their promulgations have been made from "the EASY-CHAIR?" This explains, in a measure, not only the extraordinary nature of the assumptions in Theoretical Geology, but the great instability of its hypotheses, and the frequent jarring of doctrines and opinions. Our Author argues, also, from irresistible facts, against his own hypothesis of slow formation by successive growths, torrents of water, and submersions and upheavals, when he encounters dense strata of sandstone in which delicate plants are imbedded. He finds it an "enigma" too abstruse for the geological hypothesis, and is coerced almost to the conclusion of the dependence of such strata upon something like the General Deluge. Thus he says:

"When we consider that these were the stems of hollow tu-

bular plants, equisetums, without any woody support, *it is impossible to believe* that they could have remained *erect*, in a warm temperature, without speedy destruction or decomposition, *even for a very limited time.* We are therefore CERTAIN THAT THEY WERE SPEEDILY ENCASED IN THE STRATA that now surround them; or, in other words, that *three* strata of sandstone, *nine feet in thickness, were rapidly deposited.*"

Our Author is, therefore, manfully inclined to the truth, and would have completely evoked it from its usual depth, had he carried his reasoning so far as to have unfolded the fact that the "tubular plants" would have been crushed at once by the geological torrents of water while hurling down the accompanying sand, but which would have floated safely upon our accommodating flood, and have been as safely deposited in the midst of the sand, when the latter descended at each wave's collision. And it is farther admitted by our very able and practical Author (who only made out his theories in "the Easy-Chair"), that "A successive series of extremely thin strata of iron-stone and clay, which often contain *perfect* and *delicate* remains of plants and animals, PROVES that they were deposited in tranquil water" —while the top of our Flood, as it respects the safety of leaves and delicate plants, was equivalent to tranquil water. Nor may Theoretical Geology resort to its hypothesis that all the vegetable material of the Coal-fields was deposited in the "tranquil waters" of bays, estuaries, and lakes, in emergencies like the foregoing, and neglect its assumption that it had been all antecedently subjected to torrents of water capable of overturning and sweeping down the dense forests that underwent, in some mysterious manner, deposition at the bottom of said tranquil waters. And here it should be considered that the leaves, ferns, flowers, &c., could have never subsided in this condition, but would have floated till overtaken by decay. And it is also evident that the trees, however much "saturated with water," would have never sunk below a few feet from the surface. Any earthy matter that might have been afterwards precipitated would have at once sunk beneath the vegetable material. The Rev. Dr. BUCKLAND has the following interpretation in his *Bridgewater Treatise on Geology:*

"The most early stage to which we can carry back the origin

of coal was among the swamps and forests of the primeval earth, where it flourished in the form of gigantic Calamites, &c. From their native bed these stately plants *were torn away by the storms and inundations* of a hot and humid climate, and *transported* to some adjacent lake, or estuary, or sea. Here they floated on the waters, until they sank saturated to the bottom, and, being buried in the detritus of adjacent lands, became transferred to a new estate among the members of the mineral kingdom. A long interment followed. BY THE ELEVATING FORCE OF SUBTERRANEAN FIRES *these beds of coal have been uplifted* from beneath the waters, where they are accessible to the industry of man."!!

Another perplexing "enigma" may be brought into apposition with the "tubular equiseta," and other "perfect and delicate remains of plants and animals," and the whole "fossil flora," which consists of the trees that are often found in an upright or inclined position, *penetrating through the whole mass of coal and mineral strata, by which it is demonstrated that the whole, vegetable and mineral, must have been deposited simultaneously.* And yet are the coal and mineral substances in perfectly separate strata; while the agencies of the geological hypothesis would have confounded the whole into an indiscriminate mixture.

We now come upon an "enigma" of great embarrassment to the universal tropical temperature which was required to expound the general presence of tropical plants in the Coal-formations; and this is the appearance of plants in the midst of the formations which are unknown in tropical climates, but such as are peculiar, at our regulated era, to the temperate zone. It need not be said that the two distinct groups must have been assembled from regions very distant from each other, and simultaneously assembled. The coincidence proves also, in itself, the universality of the Flood. And while thus adverting again to the assumed universal tropical heat, I may speak of the conflict of this doctrine with the "typical system" as it relates to the animal kingdom. "The Science" begins with the lowest forms of organic life, and has reached the tribes of fishes and reptiles before it introduces the higher order of animals. Here, then, is the blunder. All the geological creations antecedent to the "carboniferous epoch" were of cold-blooded animals, when the supposed heat of the earth was too exalted for the warm-

blooded. Nature protests against this caricature of her works; since, if such had been the earth's temperature, or at any stage in the process of refrigeration, she would have been consistent enough to have first brought forth those warm-blooded animals to whom the higher temperature is more suitable, and have delayed the cold-blooded to the last. But perhaps Theoretical Geology may take refuge under what we have seen of the doctrine as expressed by Sir CHARLES LYELL, that "The coal-plants may have been *endowed with a different constitution* from plants now living, enabling them to bear a greater variation of circumstances in regard to light," &c. And thus, in its efforts to expound the existence of tropical plants in the Arctic Coal-fields, Theoretical Geology completely loses sight of the exigencies of animal life, and, in its usual manner, invents an hypothesis of stupendous import to dispose of a single "enigma," although contradicted by many surrounding facts. It is, however, a becoming associate of the atmosphere of carbonic acid gas.

The question now before us was settled in the most direct manner by the discovery, long ago, of the remains of plants and animals of the highest organization in the lowest fossiliferous rocks; while we have also seen that trees of the same species now growing in temperate regions have been found in the Coal-formations. But these are only examples of a multitude of facts which prove not only that there existed at the "carboniferous era" precisely the same diversity of climates as at the present day, but also that the fossil basis of Theoretical Geology is perfectly worthless. (See Chapter XIII.) There can be no compromise with a doctrine which disjoints the organization and physical conditions of the animals and plants whose remains are found in the lowest fossiliferous rocks from their analogies of the present day, and therefore with none which invents a different temperature and a different light from such as are adapted to all the present varieties of organic life. If Geologists would study physiology before laying the foundations of a "Science" which constantly involves the fundamental laws of the organic kingdoms, we should hear no more of an adaptation of plants and animals to different conditions of inorganic nature, according to the specifications already set forth.

Let us now consider for a moment the consequences of the

Geological solution of the "enigma" of the mineral strata, particularly the calcareous, which abound in Coal-fields, and the greater "enigma" of the fossiliferous, and observe what absurdities the hypothesis involves. It supposes that there were as many "submersions beneath the ocean" and as many "upheavals" as there are calcareous strata; while the other mineral strata are referred to torrents of water like those which swept down the vegetable materials, but without any intermingling of the former with the latter. It supposes, also, that all over the earth the "submersions" and "upheavals," like the torrents of water, were exactly limited to the *spots* where the Coal-fields exist, since the strata do not extend into the adjacent land, and that, like the torrents of water, they occurred simultaneously at the various spots; that the "upheavals" took place at the exact juncture of time when vegetation was in sufficient readiness to deposit material for the Coal-strata, and that when each of these strata of coal was duly prepared the "submersions" took place to obtain the requisite calcareous and fossiliferous strata, or torrents of water were instituted to hurl down the strata composed of sand, clay, &c., and before vegetation had again started on its career (leaving behind no vestiges of seeds or soil); that, also, in consideration of the necessity of dry land for the production of plants, as soon as the "upheavals" took place the seas receded to make room for other growths of the same identical plants, but returned in due time for the necessary "submersions;" and farther, that the "upheavals," however numerous, never raised the Coal-fields, during the process of their formation, above the level of the surrounding country, nor disturbed the adjacent lands; that in all this universal crash, upward and downward, there was no derangement of either the mineral or coal strata, but every thing was so methodically conducted by the great engines of nature that Theoretical Geology, as we have seen, discovers in the "carboniferous era," and in the uses of the coal and its ferruginous and calcareous strata, great evidences of a Providential design.

But what, says Theoretical Geology, covered up all the Coal-fields, unless it have been many local torrents of water since their deposition? I answer, that the problem might be explained by referring the superincumbent earth to the same causes

that have entombed Nineveh, Babylon, &c. We have, however, in the recession of the flood an explanation abundantly ample—a cause which would have left its drift especially upon these localities, since the elevated lands which had arrested the flood-wood would have contributed again to its inhumation on the reflex movement.

I now enter upon what may be regarded as the "*pons asinorum*" of Theoretical Geology, which consists of two "enigmas"—the "dikes" and "breaks or faults" of the Coal-formations, and the "disappearance of broken and upheaved strata of coal." "A *dike*," says Bakewell, "is an elevation or wall of mineral matter, cutting through the strata in a position nearly vertical. Their thickness varies from a few inches to twenty or thirty feet, and even yards. A *fault* is a break or intersection of strata, by which they are commonly raised or thrown down; so that in working a bed of coal the miners come suddenly to its apparent termination." It will be seen, however, that the *dikes* and *faults* are essentially the same thing, though the hypothesis by which they are expounded in Theoretical Geology renders them unintelligibly different. "The disappearance of upheaved strata of coal" consists in "a mass of upraised strata of *many hundred feet in thickness*, *having by some unknown cause* been carried away, and entirely disappeared."—Bakewell's *Geology*.

These *dikes* and *faults* are the most embarrassing problems in Theoretical Geology, but the absence of which would form an objection to our diluvian theory. They are also attended by some important incidents which our diluvial theory requires, and by which it is corroborated; and these, therefore, must receive a particular consideration. The phenomena, when explained, will appear, like most other things that may be submitted to the ordeal of truth, to be perfectly simple. In the first place, then, the hills of which I have spoken as supplying the mineral strata for the Coal-formations, should not have been always wholly demolished; since it will be readily seen that their central parts would have often consisted of indurated or rocky substances. Such was then, as now, the case; and these central portions have had a large share in the geological philosophy of some of the "enigmas" which I have hitherto considered. "The dikes which intersect the Coal-strata are frequently composed of

indurated clay, basalt, and greenstone." They also, as they should, "cut through the strata in a position nearly or altogether vertical."

Now, Theoretical Geology supposes that these dikes were "upheaved" after the coal had become matured; and a suggestion may as well, therefore, be made, before proceeding to our analysis, which must have the effect of overthrowing the whole geological fabric of the Coal-formations, and of confirming our diluvian theory. It is simply this: These apparent intrusions abound in Coal-fields, and rarely, if ever, appear above the level of the surface! They are necessarily supposed to have been of volcanic origin; and therefore it is that their uniform depression to a level with the surface, generally covered by the coal, is so suggestive both as to the geological and the diluvian doctrines. To suppose that such a general phenomenon could have arisen from volcanic action without disturbing the surface of the Coal-fields, is, like the repeated "submersions" and "upheavals" of the entire fields without deranging their structure or raising them above the common level, to suppose the most absolute impossibilities.*

* Bakewell supplies a summary statement of "The principal geological facts relating to the Coal-formations," among which are the following:

"The Coal-strata, after their deposition *in inland lakes* or estuaries, SUBSIDED and were SUBMERGED IN THE OCEAN, and were covered in many parts by marine strata, particularly by the magnesian limestone." "The faults and dikes that dislocate the Coal-strata were, in some instances, formed before the deposition of the upper marine strata; other faults were formed at a subsequent epoch, after the deposition of the marine strata. But in both cases it may be inferred that *the strata were beneath the sea when the dislocation by faults* (or dikes) *took place.* At a later period, the Coal-strata and the upper marine limestone by which they are in some parts covered were raised above the sea, and form a portion of the present land." "That the strata of the Coal-formation have been submerged under the ocean is completely established." [!]—Bakewell's *Geology.*

The Rev. Dr. Buckland says, in his *Bridgewater Geology*, that "BY THE ELEVATING FORCE OF SUBTERRANEAN FIRES THE BEDS OF COAL HAVE BEEN UPLIFTED FROM BENEATH THE WATERS, where they are accessible to the industry of man;" which is regarded as a very Providential design.

Sir Charles Lyell supposes that where "the marine mountain-limestone *alternates* with strata of coal, the arrangement of the beds may possibly have been produced by the ALTERNATE RISING AND SINKING OF LARGE TRACTS, *which were first laid dry, and then submerged again.*"

And thus the Rev. Dr. McCosh, in his *Typical Forms in Creation* (1856)—"By various and *gigantic appliances of subterranean forces* the original deposits of coal have been broken up, changed in position, and brought nearer the surface, and *thus placed within the reach of man.* UPHEAVINGS have followed the *throes* of Mother Earth," &c.

But before proceeding farther with the "pons," it may be well to say that Theoretical Geology places the "carboniferous era" at a period of time long antecedent to many of its alternate upheavings and submersions of all parts of the globe, and observe how oblivious of these convulsions is Theoretical Geology when it approaches the Coal-formations, and how completely these formations contradict, by a single fact, the whole immense system of geological revolutions. Why then, I say, have not the Coal-fields shared the fate of the numerous shocks which are said to have shattered again and again the "crust of our planet?" These fields are distributed over its surface, and they still remain just as they were deposited, undisturbed, and on a near level with the ocean.

If we now interrogate the special circumstances attending the dikes, or faults, and breaks of the Coal-fields, we shall find every individual fact proclaiming the same conclusions. I shall present these critical tests in the language of an eminent advocate of the geological hypothesis, and of great familiarity with the Coal-formations. Thus—

"In some Coal-fields the strata are raised or thrown down on one side of a dike one hundred and fifty yards or more; and the miner, instead of finding coal again, meets with beds of stone or clay *on the other side.* Hence he is frequently at a loss to proceed in searching for the coal which is thus *cut off.* If the stratum of stone be the same as any of the strata that were cut through in making the shaft, it proves that the bed of coal on the other side of the fault is thrown down, and he can determine *the exact distance* between the stratum and the coal he is in search of."—BAKEWELL'S *Geology.*

Now, every statement in the foregoing extract will be seen to contradict the agencies in the hypothesis of slow formation. Upon our diluvian theory, these dikes, which existed in the form of hills at the time of the Flood, should have resisted the force of the impinging forest, while they should have been, according to the fact, denuded of their more yielding investing matter. The collisions should also have had the effect of *breaking off* the summits of the dikes, or other adjacent stones, and these should have appeared, just where Geology finds them, on the side of the dike opposite to that where the collisions took place. Or, if

Theoretical Geology continues to think otherwise, I would then inquire as to the origin of these stones. Will it assume, as it otherwise must, that they were deposited in fragments from the ocean when the Coal-fields underwent their supposed submersions? In the mean time, the flood-wood should have been piled up on that side where its force was expended, so as to have presented the appearance of having been "raised, or thrown down;" and this should have often happened with so much precision as to enable "the miner to determine the *exact distance* between that stratum and the coal he is in search of." Nor is there any other imaginable solution of such a general precision of this apparently most incongruous combination of phenomena than that which is here afforded, and which was certain to bring about these exact results in the localities where they appear.

Again: it is another critical test of the opposing theories, that at other times the coal, in geological phraseology, is "raised or thrown down on *both sides* of a dike." In these cases, as in the preceding, it is imagined that the dike, at its supposed upheaval, carried up the incumbent strata of coal; but it is not a little remarkable that this inclined appearance of coal upon both sides of a dike in some cases, in connection with the absence of coal upon one of the sides in other instances, had not given a totally different direction to Theoretical Geology in its groping after causes. The presence of coal upon both sides of a dike, as an abstract fact, undoubtedly would appear like an "upheaval" to all who look no farther than the fact itself; as in the matter of "a universal tropical temperature," "the glacial theory," &c. But not so with dikes which have inclined beds of coal on one side and a pile of stones on the other. They stand, apparently, in contradiction to each other; and yet it will readily appear that a common cause has brought them into this condition. We have just seen how the deluge operated in giving rise to the disjointed strata and the substitution of rocks for the absent portion; and doubtless the reader has anticipated us in discovering that the other phenomenon was brought about in two ways. First, that, where the hills were small (and the dikes are sometimes quite thin), the flood-wood made its invasions upon both sides, and in this manner was piled up upon both; and, secondly, and far more frequently, that, where the hills were large,

the attrition was chiefly upon one side, and the flood-wood was driven over the top of the dike upon the other. It is also stated in Theoretical Geology, that—

"It is *remarkable* that the beds of the coal-measures upon *one side of these dikes are almost always higher than on the other side.* Hence these dikes are often called *troubles*, on account of the great trouble which they give the miners to discover the bed of coal upon the other side of a dike which they had dug out, on the side at which they were working, as far as the dike itself."—*Prof.* TH. THOMSON'S *Geology and Mineralogy.*

This is bringing the matter to a great degree of precision; since it is obvious that the coal should be higher upon that side of the dike where the collision took place than upon the side where the vegetable mass had merely tumbled over; or, as Theoretical Geology has it, "*thrown down.*" This greater elevation of coal upon one side of a dike than upon the other being very general, and the substitution of rocks for coal in other instances upon one side of a dike, shows that the collisions were often limited to one side only. The reader's attention should be directed especially to this unique and almost universal phenomenon, as being a very conclusive proof against the geological hypothesis of volcanic upheaval subsequent to the formation of the Coal-fields, since it proves, particularly in connection with the universal limitation of the disturbance of the Coal-strata to the precise places of these dikes, that a very different, exact, and common cause has operated in all the cases.

Certain varieties occur, also, in respect to the disposition of the dikes, which are expounded at once by our diluvian theory, but which greatly aggravate the hypothesis in Theoretical Geology. That is to say, for example, the "dikes sometimes cut the strata in the *line of the dip*, and sometimes in that of the *line of bearing*, and frequently *in lines diagonal to both the dip and bearing of the strata*, crossing the Coal-fields in various directions and intersecting each other." Such are exactly the varieties which should arise from the different relative positions of those hills whose central parts were not demolished, and which constitute the dikes; and this especially where several hills were in proximity to each other. The natural effect of the indurated central portion of the congregated hills would have been that of

producing an appearance of a very broken condition of the strata; since the flood-wood was detained by all these hills till they were denuded of their loose covering, and the intervening valleys filled with the vegetable material, partially piled up upon the sides of the dikes. Hence the appearance is compared to "*the lines and intersections produced by the disruption of a sheet of ice.*" And yet Theoretical Geology, through its most practical observers, imagines that this extensive net-work of basalt or other indurated matter was thrown up subsequently to the formation of the Coal-fields by violent volcanic action, although the surface of these fields never appears disturbed, nor do the "dikes" appear above the surface, though their tops are sometimes visible on the level. But lest it be imagined that this is more of a caricature than a fair representation of the subject, I shall show that it falls short of the reality. Moreover, it is important to the natural simplicity of our diluvian theory that it should be fully understood to what extent Theoretical Geology is obliged to convulse the Coal-fields by "upheavals of dikes" without disturbing the surface, or appearing above the level. Thus:

"Faults," says BAKEWELL, "filled with basalt [or dikes] intersect all Coal-formations; and, from the extreme hardness of the stone, they may *often be traced* ON THE SURFACE where they cut through secondary strata, and thus furnish certain evidence of their occurrence. Faults filled with clay or fragments [simply 'dikes'], that have produced vast dislocations, *often present no visible proofs of their existence*, except what may be discovered by penetrating the surface." "Faults [or dikes], where their occurrence can be examined and fully ascertained, are manifestations of the *extraordinary and* VIOLENT ACTION *of internal causes*, that can not be mistaken by the Geologist. They afford him certain evidence of *former terrestrial convulsions*, as if he *saw the earth opening and* UPHEAVING *before his eyes;*" but never rising above the surface or disturbing the strata of coal excepting in the exact places of the dikes. Indeed, our Author says that, "I know of *no instance* that has fallen under my own observation in any part of England and Wales where the upraised strata in a Coal-field are to be *traced on the surface.*"

Our diluvian theory requires, also, the test of instances in

which there should be the appearance of the supposed upraised strata of coal being "*carried* away;" an "enigma" at which Theoretical Geology apostrophizes after the following manner:

"*However great*," it says (Bakewell being still the interpreter), "may be the *uprise* or the *downcast* (terms exactly suited to our diluvian theory) of the strata on one side of a dike, *no indication of any disturbance is visible on the surface.* A mass of upraised strata of many hundred feet in thickness has, by some unknown cause, been carried away, and has entirely disappeared. The fact is *general*, and can not be explained EXCEPT BY A GENERAL CAUSE."

Before proceeding to an explanation of this critical test of our diluvial theory, it should be understood that the geological hypothesis supposes that in these cases particular sections of a Coal-field had been elevated to variable heights above "the main bed of coal," and that, according to these supposed elevations, the strata should have been raised to a corresponding height *above the surface.* Thus, in an example presented by Bakewell—

"The main bed of coal is supposed to lie at the depth of nine hundred feet from the surface, and covered with strata of sandstone and shale; that in one section this main bed is raised to within two hundred feet of the surface, and the mineral strata above are entirely wanting; that in another section the main coal is seven hundred feet from the surface, and a mineral stratum is found again over the coal. In another section the main coal is within two hundred and fifty feet of the surface, and only a part of a mineral stratum occurs. In the section where the strata of coal have been elevated seven hundred feet, *we might expect to see a corresponding elevation of the ground*, and that the whole series of strata would form a *hill of seven hundred feet in height; whereas* THE SURFACE OF THE GROUND PRESENTS NO INDICATION OF ANY DISLOCATION OR UPHEAVING OF THE BEDS," being in that respect the same as in all other cases of dikes, or faults.

Mr. FAREY, in speaking of the same phenomenon in his work on the *Derbyshire Coal-fields*, says: "I proceed to notice one of the most curious and important phenomena which *the earth's surface presents*—namely, that, though the strata are, as it were, *tossed and turned and turned about* in all degrees, of the several cases men-

tioned, as miners and colliers in particular can testify, yet that it is extremely rare to find a *lifted edge* or *corner* of strata STANDING UP ABOVE THE GENERAL SURFACE, *or occasioning a precipice or cliff.*"

Although the foregoing is regarded as "the *most surprising fact* that geology presents," it will be seen that it is what our diluvian theory demands, in all the details of the phenomenon, as indispensable to its integrity. Nevertheless, Theoretical Geology does not give it up, but proceeds in its usual manner to violate all the attendant probabilities:

"An effect," says Bakewell, "so extensive as the entire disappearance of the broken and upraised strata, in all our coal districts that have hitherto been examined, could not be caused by local inundations sweeping over the surface of the land; for it may be asked, why should such inundations select for their theatre of action all the coal districts in Scotland, England, and Wales? Nor will a *General Deluge* explain the disappearance of the upraised strata, because it can be proved that the strata *were broken and raised by dikes or faults* at different and remote periods. [!] A succession of general deluges would therefore be required; one, for instance, before the deposition of marine limestone that covered the Coal-strata after their upraised beds had been removed, and another deluge would be required to carry away the strata raised by faults at a later epoch, after all the marine beds had been deposited."

Here, therefore, too many deluges are required, and their "theatre of action too select," even for Theoretical Geology; and so, proceeding upon its architectural arrangement of the strata of marine limestone and of the mineral detritus, and its fundamental fallacy of "submersions" and "upheavals," it goes on to dispose of the "pons" according to those premises. Thus—

"To conclude—the disappearance of all the strata upraised by dikes, or faults, in every known coal district, can, I believe, be best explained by admitting the causes I have assigned; first, the soft and yielding condition of the *submerged strata*, that had never been indurated by drainage; and secondly, the violent action of water upon them, when they were suddenly broken and forced upward, but were still beneath the surface of the ocean."

He thinks, however, that "the mountains and mountain-ranges

[among our important barriers to the flood] that occur beyond the limits of coal districts may at first appear to oppose what has been stated respecting the disappearance of the upraised Coal-strata."—BAKEWELL'S *Geology*.

Here, then, as everywhere else, we see it strongly exemplified that, where hypothesis lays its foundation in error for the interpretation of a complicated system of facts, every movement is a blunder. In the case before us, as in all other instances, Theoretical Geology imagines that the dikes had been thrown up after the formation of the Coal-fields, and therefore infers that they should have been overlaid, as in other cases, by coal and mineral strata; and since it revolts at the supposition that "local inundations should have selected for their theatre of action all the coal districts of Scotland, England, and Wales" (notwithstanding its assumption of exactly such "local inundations" for the purpose of accumulating the vegetable matter), it avails itself of the sea to expound the disappearance of what had never an existence! And yet is this assumption, however absurd, the only one by which the hypothesis can dispose of the "enigma."

But our diluvian theory resolves this paradox in a single sentence, and in exact conformity with every other phenomenon of the Coal-formations. It declares that an absence of the coal or mineral strata is a necessary fact, for the simple reason that they were never *there*. It says that there would have often happened an overshot of the vegetable mass in these cases of dikes; since the earthy matter investing the dikes that was capable of being broken down would probably have been often exhausted before the basins were filled; and that in the other cases there was equally a want of earthy matter to detain the flood-wood, and therefore, in the failure of material for mineral strata, and an adequate resistance, the vegetable mass would have moved forward till it encountered other neighboring hills, and would have thus left the "disappearance of strata" which has so long embarrassed Theoretical Geology; or, carried yet farther onward upon the accumulating waters as they encountered the "mountains and mountain-ranges that occur beyond the limits of the coal districts," the mass would have taken a backward course as the wave receded, and have been thus maintained in those positions which are within "the limits of the coal districts."

Another very critical test of the supposed "upheavals" remains to be noticed in connection with the *basaltic dikes*, namely the absence of all marks of heat in bituminous Coal-fields, upon those portions of coal which lie in contact with these supposed molten dikes; although it has been said that the adjacent coal has sometimes presented the appearance of having been acted upon by heat. But this is only so in the rare localities which have been manifestly elevated by volcanic action subsequently to the formation of a Coal-field, as in the elevated anthracite mines of Pennsylvania. In these localities the bituminous matter has been driven off by the agency of heat, and the coal thus converted into anthracite; which shows the effect of volcanic action upon Coal-fields, and, in its turn, completely disproves the geological hypothesis relative to the basaltic dikes in all the bituminous localities. A good exemplification of basaltic heat, and to which I have already referred (Appendices I. and II.), is to be seen over an extent of several miles at the trappean Palisades of New Jersey, which skirt the Hudson River, and which have been thrown up to an elevation of several hundred feet through an aqueous deposit of a granular substance composed of feldspar, quartz, &c., varying in thickness from ten to twenty feet, and where this material in contact with the trap has been converted by the heat into a solid rock over an extent of a few inches to three or more feet, but particularly so in *basaltic* portions, as in the region of Weehawken.

Finally, it is an "enigma" in Theoretical Geology that so few others than the fossils of aquatic animals should have been discovered in the Coal-formations. It was originally an assumption that no others existed at the "carboniferous era," and their assumed absence from the Coal-fields was one of the principal reasons for locating that era far back in the geological eternity. But fatal exceptions, as we have seen, have subsequently come forward in the fossil remains of terrestrial animals of a high organization, both in Coal-fields and in mineral strata of an anterior date, and such as have their exact analogies at the present day. HUGH MILLER, in his *Testimony of the Rocks* (1856), speaks thus of the existence of "large reptiles:" "These reptiles of the carboniferous era, though only a few twelve-months ago *we little suspected the fact*, seem to have been *not very rare in our own*

neighborhood." "Little more than a mile from where the Duke of Buccleuch's palace now stands, *large reptiles* had congregated in considerable numbers shortly after the great eight-feet coal-seam of the Dalkeith basin had been formed."

Sir CHARLES LYELL remarks, in his *Antiquity of Man* (1863), that "For no less than thirty-four years it has been a received opinion in palæontology that reptiles had never existed before the permian or magnesian limestone period, when at length, in 1844, *this supposed barrier was thrown down*, and *carboniferous reptiles*, terrestrial and aquatic, of several genera, were brought to light." In his *Principles of Geology* he states that "We find in the eocine, or oldest strata of the tertiary group, the remains of a *great assemblage of the highest or mammiferous class, all of extinct species.*"

Other examples of similar fossil remains anterior to the "carboniferous era" have been presented, in conformity with geological estimates. Nevertheless, the occurrence of such fossils in the Coal-formations should be extremely rare upon our theory of the General Deluge, and this rarity our theory claims in its own behalf. Had it been otherwise, indeed, or had the fossils of the higher orders of animals been often found beneath the diluvial drift, it would not be explained by the General Flood. Our theory claims their general absence in consideration of the comparative rarity of man and terrestrial animals, of their widespread diffusion *upon the surface of the waters* at the time of the Flood, and of their very perishable nature when thus exposed to destructive agencies. Nor were they likely to have been often entangled in the flood-wood of the Coal-formations, but their bones must be looked for on the surface of the ground. On the contrary, however, the local torrents of Theoretical Geology should have carried down a large assemblage of mammiferous animals in every coal-field of the temperate regions. Such animals have, indeed, been occasionally found, along with certain existing plants, the modern aspect of which is a very troublesome circumstance to Theoretical Geology. It therefore invents a second carboniferous era to meet these special exigencies, and bestows upon these particular fields a name which belongs equally to every coal-field, after the following manner:

"The formations of *wood-coal*," says Bakewell, "are of far

more recent date than of common coal, though their origin must be referred to a former condition of the globe, *when animals like those existing at present in tropical climates flourished in Northern latitudes*, as their remains sometimes occur in the wood-coal of Europe;" while Lyell supposes that the plants of all the Coal-fields "may have been endowed *with a different constitution* [from those now existing], enabling them to bear a greater variation of circumstances."

Nor will the reader fail to associate the foregoing facts with what we have seen of fossilized animals of high organization in the Coal-fields of an admitted earliest date, and the trees in the Glasgow quarries and Newcastle Coal-fields, which are similar to others now flourishing around those formations, and the nuts "found in the great repository of coal near Cologne," and which are the production of trees now growing in Hindostan and China. But what especially shows that all these incongruous speculations, to resolve the "enigmas" of the nuts and the animals, have emanated from the "Easy-Chair," are contradictory statements made by the same authors. The following example is of that nature, and alone demolishes the whole fabric of the geological hypothesis of the Coal-formations. Here, it will be seen, are the bones of an animal of the highest order, not only in organization but in stature, imbedded in one of the oldest, or so-called *mineral* coal-fields. Thus our Author, Bakewell—

"A still more remarkable formation occurs at Alpnach, in Switzerland, where a bed of coal is found at the depth of two hundred and eighty feet from the surface. Over the coal there is a stratum of bituminous limestone containing fluviatile shells, and *bones and teeth of large mammalia*, particularly the teeth of a species of *mastodon*. Notwithstanding the occurrence of the bones of *large land quadrupeds* in the stratum over the coal, the coal approaches in character *nearly the mineral coal*, and the strata of micaceous sandstone and shale above it have a *close resemblance to those in our English Coal-fields*."

In the same manner in which I have endeavored to expound the general absence of quadrupeds from the Coal-formations, may be explained, in part, the infrequency of their occurrence in the lowest fossiliferous rocks. Although such as may have floated upon the diluvial waters would have speedily undergone

the usual decomposition, this objection does not apply to the bony fabric. Antecedently to the Flood, more local causes overpowered them in some localities, and entombed them in the now consolidated drift. Nevertheless, such was the nature of the General Deluge, that it would have buried in the superficial drift no small number of quadrupeds, the least perishable of whom, especially the bones of an elephantine size, would be likely to have escaped entire decomposition to the present day, though not for a geological age. Such is the fact, and surrounded by circumstances corroborative of the Noachian Flood. "The skeletons," as we read, "of terrestrial quadrupeds and other mammalia are found almost universally diffused over the surface of the globe, imbedded in diluvial clay or gravel, and insinuated into caves and fissures of rocks. These animals consist of extinct species and genera *mingled* with several species *at present in existence.* The mammoth, hyena, rhinoceros, and other animals of *warm climates*, strew the *plains* of the *temperate* and *frigid* regions, as well as those of the *torrid* zone; while those of the hippopotamus, an animal at present confined to the rivers of Africa, are found in Europe and India, and marsupial animals, now only found in New Holland and South America, are recognized *among the fossils of Europe.* This *diluvial* matter, more or less charged with the relics of terrestrial animals, is found in every region *strewed over the uppermost stratum of whatever series the stratum may be.*" Other citations of the same nature have been made in Appendix II.

The abundance of these remains denotes that multiplication of the animal tribes at an early era which is implied by the Narrative of Creation; while the absence of similar vestiges of man indicates a more limited extent of the human race. And this leads me to some farther remarks upon the absence of the remains of man and mammalia in the Coal-formations. In the first place, very extravagant estimates have been made of the antediluvian population. WHISTON, in his "Theory of the Earth," places it at 500,000,000,000, or, as he says, "ten times as many as the present earth can well be supposed capable of maintaining in its present constitution since the Deluge." BURNET, in his "Theory of the Earth," considers 10,000,000,000 an extravagant estimate, being a difference from Whiston's of 490,000,000,000.

But Theoretical Geology may here, as everywhere else, be easily rectified by referring to the Word of Inspiration. There we are informed that, when the Flood was ordained, "Men *began* to multiply (not had multiplied) on the face of the earth;" an expression which, it can not be mistaken, is intended to imply that the population was not then large, and should be associated with our other internal proof of the Inspiration of the Narratives of Creation and the Flood. This is also conformable to the numerical progress of the human race during even the last few hundred years; and I may add, that both considerations in connection form a substantial ground for the conclusion that the earth was densely covered with vegetation. This brings into view an important proof that may be derived from the inhumation of that vegetation in the Coal-formations, and which has the remarkable attributes of showing that the earth was only sparsely inhabited before the Flood, and that the human race is of recent origin. In the former case, had the population been as large as at the present day, the Coal-formations in Europe and America would attest the fact. In the latter case, it is equally certain that mankind would have overrun the earth, Europe especially, had the race existed ten thousand years before the time of Moses, and the Coal-fields would have been as necessary to them as to us. (See Chapter XII., on the *Antiquity of Man.*) But this bountiful provision, which Theoretical Geology, to relieve its speculations, regards as a matter of "design," has been only in recent times applied to the most important wants and uses of mankind. Considering, therefore, that the constitution of the human mind has been always the same, and looking at its progress, and the march of improvements and of population since man began to record his observations, and the absence of monumental records of the race of a higher antiquity than those of Babylon, Nineveh, and Egypt, how absurd does the speculation appear of the existence of man even for twenty thousand years! (Chapter XII.)

The foregoing considerations enable us to understand still farther the reason why we may not expect to meet often with the remains of man or of the mammalia in the Coal-formations, or in any other. Whatever may be the estimated number of mankind at the time of the Deluge, it will not affect our question; since their remains have not been found in the diluvial mineral

drift, which is incomparably more extensive than the Coal-fields. This is also what we may continue to expect, since it would have been the effect of the Deluge to have dispersed them in all directions, and as well over the seas as the dry land. As the earth's surface consists of 196,000,000 square miles, two-thirds of which are water, it is evident that there is no probability that more than a very few individuals, at most, would have been conveyed to the exact spots of the Coal-formations; and this consideration holds true of all land animals, although not to the same extent as of man and the domestic animals.

Should the remains of man be discovered in the proper fossiliferous rocks outside of the Coal-formations, there can be little doubt of his having been entombed before the Flood. But this would not be likely to have happened unless when suddenly overtaken by avalanches of water or of earth, or through other unusual casualties; since it can not be doubted that man was as vigilant of his safety in the antediluvian as in the post-diluvian world. But if we allow the improbable number of fifty to have been entombed before the Flood in Asia, whose area is about 16,000,000 square miles, and that the individuals were equally distributed, it will be necessary to dig over the earth, and examine the rocks *in every part* of a section of more than 300,000 square miles before we might meet with the remains of an individual. This gives us some apprehension of what is to be accomplished in geology before it can pronounce even upon a general absence of the remains of existing races of land animals in the fossiliferous rocks; for it may be safely said that its explorations are no greater than the ratio of a few pin-holes to the entire surface of a globe of a mile or more in diameter. And when it is considered that the area of the seas is about two-thirds greater than that of dry land, it is manifestly impossible to determine the extinction of any aquatic animals. This, indeed, is remarkably confirmed by the late deep-sea explorations by the British "Lightning" and "Porcupine" expeditions, as already related (p. 449).

In regard to the "extinction" of plants and animals, I have hitherto controverted Theoretical Geology upon its own ground of a gradual process. But the discussion has related mostly to those which became extinct, by universal admission, antecedent-

ly to the reputed time of the General Deluge. I now come to another and very different view of the subject, derived particularly from the extinct plants which contributed to the Coal-formations. We have seen that the geological hypothesis of the slow formation of the Coal-fields necessarily fails from a great variety of insuperable difficulties; among which is the very important one of a greatly inadequate supply of vegetable material. This would have arisen not only from the deficiency of land in the regions of the Coal-fields, but particularly from the complete eradication of seeds from the soil by the very first of the supposed torrents of water. But by no means so with the Noachian Flood; and the proof which I am about to offer will make another very serious invasion upon the geological hypothesis of the Coal-formations.

1st. That numerous species and genera of plants were *suddenly* extinguished at the "carboniferous era" is conceded by all. Indeed, only a very few survivors have as yet been detected. The same species, also, occur in all the Coal-fields, and from top to bottom they are the same. Such, at least, is the general, if not the universal fact. Now, does not each one of these facts prove the dependence of the Coal-fields upon a sudden and universal Flood? If Geology still insists upon a universal tropical temperature, all the local torrents of water that may be invented will not begin to expound the general disappearance from *all the face of the earth* of that variety of plants which make up the Coal-fields, and at that exact juncture of time; but none extinguished till the fields were completed, when all but a few of the old stock vanished forever. Admitting, however, their extinction by local torrents in the vicinity of the Coal-fields according to the geological premises, what was it, I ask, that extinguished them in all other parts of the earth which were not molested by the supposed torrents?

2d. How did the earth become clothed with a different vegetation subsequently to the "carboniferous era?" There is no other possible solution of this "enigma" than the General Deluge, without adopting one of the alternatives of Theoretical Geology—either "a renewed operation of the organic law of creation" or a new "parturient effort of the earth." But our diluvian theory not only interprets the phenomenon in the most con-

sistent manner, but both the general extinction of the old vegetation and the growth of other species are indispensable to the theory. This is determined in our own experience. Nothing is more familiar to our observation than that when a forest has been felled, *burnt over*, and neglected, it is succeeded by species of trees, shrubs, and herbaceous plants, entirely different from the preceding; and although there is not a new species among them, many of the same may not be found within a distance of fifty or a hundred miles. The seeds of these plants had descended from an ancient stock, and had been safely entombed in the earth probably for centuries. Nature has been often detected in this act of preservation at a depth of many feet below the surface, especially in morasses. The fire had destroyed the seeds of the former plants, which were only superficially buried. In the case of the Flood, the earth being universally disturbed at its surface, especially in regions not greatly elevated, the seeds of that era generally perished, while those of other plants of a former period rested securely in their deeper deposits. The earth, therefore, contrary to Theoretical Geology, is now mostly clad with species of plants which preceded those of the "carboniferous era." There should be added, also, to the foregoing means of preservation the very probable escape of many plants upon mountainous regions where the force of the waters was greatly expended, and especially in ravines that were protected by nearly adjacent mountains. Hence the preservation of some of the species which contributed to the Coal-formations. Nor does an undisturbed condition of deeply imbedded seeds at all interfere with the sweeping away of such barriers as had given rise to lakes and excavations to which the resistance of barriers had been tributary.

It appears, therefore, that Theoretical Geology has built upon fossils which represent a vegetation that once formed an integral part of what has been transmitted to us. This is also confirmed by the present existence of a few of the species of trees that are found in the Coal-fields; while, also, as we have seen, "large coniferous trees are common to fossiliferous strata of all periods." And, says the same principal authority in Theoretical Geology—"These discoveries are *highly important*, as they afford examples among the earliest remains of vegetable life, and of IDENTITY IN

MINUTE DETAILS OF ORGANIZATION between the *most ancient* of the primeval forests of our globe and some of the *largest living* coniferæ."—BUCKLAND'S *Geology*.

Theoretical Geology gains nothing, therefore, from this kind of "medals," but which, on the contrary, attest the factitious nature of all those which have hitherto borne an important part in its arrangement of the fossiliferous rocks, its typical system, its high tropical temperature in northern regions, its carbonic acid atmosphere, and its doctrine of spontaneity of being. Take, then, the "medals" as we find them; give to them that natural import which is stamped upon their living prototypes, or their exact analogies—each and all come to the rescue of the most fundamental laws of nature, of the greatest and best established principles in science, and to the defense of that Revelation which needs the protection of man only for the sake of his own dignity, his moral worth, his duty to a Beneficent Creator, and as a manifestation of gratitude for the revelation of what he was, and is, and is to be, and of the origin of that nature by which he is surrounded, which was created for his uses and enjoyment, and through which he might contemplate the Infinite Wisdom and Goodness of its Author.

THE END.

ERRATA.

Page 130, line 15 from end, for *body*, read *senses.*

Page 349, line 11 from end, for *Infidelity*, read *Science.*

WORKS BY DR. PAINE.

I.

Medical and Physiological Commentaries. Octavo. Vols. I. and II., 1840; pp. 1531. Vol. III., 1844.

II.

Institutes of Medicine. Octavo. First Edition, 1847. Ninth Ed., 1870; pp. 1151.

III.

Materia Medica and Therapeutics. 12mo. First Ed., 1848. Third Ed., 1859; pp. 411.

IV.

Physiology of the Soul and Instinct as distinguished from Materialism. Octavo, 700 pages; 1872.

V.

Memoir of Robert Troup Paine. 1000 copies, illustrated; Quarto; pp. 524. One copy, folio, for the library of Harvard University; privately printed, 1852.

VI.

On the Cholera Asphyxia of New York. Octavo. 1832; pp. 160.

VII.

On the Philosophy of Vitality, and on the Modus Operandi of Remedial Agents. Octavo. 1842; pp. 70.

VIII.

Experiments to ascertain whether the quantity of Blood circulating in the Brain may be reduced by Bloodletting. Published originally in the *Medico-Chirurgical Review*, London, 1834.

IX.

On Theoretical Geology, sustaining the natural interpretation of the Mosaic Narrative of Creation and the Flood, in opposition to the prevailing geological hypotheses. Octavo; pp. 121. Published originally in the *Protestant Episcopal Quarterly Review*, New York, April, 1856.

X.

Organic Life as distinguished from the Chemical and Physical Doctrines. 12mo. 1849; pp. 53.

XI.

Examination of Reviews. Octavo. 1841; pp. 96.

XII.

Physiology of Digestion. Octavo. 1844.

XIII.

Defense of the Medical Profession of the United States. Octavo. 1847.

XIV.

Essays and Reviews in Medical and other Periodicals, among which are seventeen articles showing the superiority of Medical Education in the United States over that in Great Britain, founded upon Parliamentary Documents, and which appeared editorially in the New York *Medical Press* from Jan. 29 to June 4, 1859.

THE

INSTITUTES OF MEDICINE.

By MARTYN PAINE, A.M., M.D., LL.D.,

Professor of the Institutes of Medicine and Materia Medica in the University of New York; Author of the "Medical and Physiological Commentaries," "A Treatise on the Soul and Instinct," "Therapeutics and Materia Medica," etc., etc.; Corresponding Member of the Royal Verein für Heilkunde in Preussen; Corresponding Member of the Royal Medico-Chirurgical Academy of Turin; Corresponding Member of the Gesellschaft für Natur und Heilkunde zu Dresden; Honorary Member of the Imperial University Physico-Medical Society of Moscow; Member of the Medical Society of Leipsic; of the Medical Society of Sweden; of the Montreal Natural History Society; and of many other Learned Societies.

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October 8, 1858.

From the New York Journal of Medicine, May, 1858.

"The *Institutes* is full of learning and philosophy, and the reader, while impressed with the profound erudition of the author, can not but be amazed at the amount of labor the book discloses. * * Professor Paine is engaged in a struggle for truth. His mind is concentrated upon the elimination of facts, and in the pursuit of what he deems right he seeks not the applause of his contemporaries. He knows full well that principles must and will survive the disputations of the controversialist. * * He is, in every sense of the word, a medical philosopher, a devotee of science, and a commentator whose opinions will not only pass to posterity, but receive the high tribute to which they are entitled. Inflexible in his convictions of truth, he can not be moved by friend or foe—and he pursues his onward course with an earnestness and zeal characteristic of the man. * * We can confidently recommend the Institutes both to the practitioner and student of medicine; to the former it will be a rich treat—it will open to him the wide and fruitful field of medical science, and he will see elaborated in it the great and leading questions which have so long constituted the basis of controversy among the learned in our profession. The latter will find it a treasury of knowledge—a veritable encyclopædia—full of the prominent facts of his science; and its tendency, moreover, will be to induct him into habits of thought and reflection. Lastly, we may be permitted to say that the article on the 'Rights of Authors' has been elicited by what Professor Paine deemed an infringement upon his claims; and he has entered upon the subject not only with zeal, but, in the language of the law, he has made out his case by a chain of very positive evidence."

From the same Journal of July, 1858.

"There is no where to be found in medical literature, nor in all medical works extant put together, so full, so complete, so accurate an exposition and elucidation of the functions, and the paramount importance of the *ganglionic* system in influencing all the organic functions (including *secretion*) physiologically and pathologically, as is contained in the 'Institutes' and other writings of Dr. Paine. An examination of the *Index* of the 'Institutes' alone will prove this. Fifty such essays as that of Dr. Campbell could be compiled from the 'Institutes,' and then leave material, facts, and illustrations enough for as many more, all embodying and setting forth the same doctrines. * * The author of the 'Institutes' and of the 'Medical and Physiological Commentaries' can well afford to bide his time. His fame is secure. It will grow brighter with time. The profession will delight to cherish it and to do him honor. They will not allow a single particle of his just merits to perish, or to be appropriated by others. Posterity will vindicate all his just claims and assign his rank among the great minds of our country. But few properly appreciate, or are even acquainted with the extent of his Herculean labors. None but those who have labored in the same field can justly estimate the vast range of his learning.—C. A. L."

From the American Medical Gazette, New York, June, 1858.

"That the 'Institutes of Medicine' and the 'Medical and Physiological Commentaries' are characterized by great analytic power, profound philosophy, rare genius, and unsurpassed learning, no candid reader can deny; that they will rank with the foremost works in our science, and entitle their author to a high rank among the greatest men in medicine, will hardly be disputed. * * In the late Appendix to the Institutes many important subjects are discussed with the usual acuteness and ability of the author. The Index, of 175 pages, may well be called a *model index*, as it contains a brief summary, as it were, of the entire work."

The September Number of the foregoing journal contains a forcible and triumphant article of thirteen pages, by Professor C. A. Lee, in defense of Professor Paine's claims of originality in elucidating and applying what is designated as the "excito-secretory function of the nervous system," and showing that the term itself has been derived from his Institutes of Medicine. We quote the following:

"Dr. Paine claims, and very justly, as may be seen by our extracts, a long priority in designating the nervous mechanism through which the secretions are physiologically influenced; and although he has not thought it worth his while to insist upon his priority in the small matter of bestowing a name upon the function, we have shown that he suggested the very name which is now apparently conceded by nearly all the medical periodicals in this country to form the only originality belonging to Dr. Campbell. But what is alone of any importance, Dr. Paine was not only the first, but still the only one to carry the 'excito-secretory function' and all the physiological laws of the nervous system into pathology and therapeutics. * * But Dr. Paine regards the *excito-secretory* function of the nervous system as a very minor part of the influences of that system, the most important of which is its variously alterative effects upon the organic functions; or, in his own language, 'in all the cases the nervous power is rendered *stimulant*, or *depressant*, or *alterative* to the organic properties and functions, and variously energetic, according to the operating cause, and the intensity and suddenness with which it may operate."—p. 107.

"The whole of this disputation has had its origin in a mere pretense that has grown out of a name. *Excito-secretory function* is the magic word which is made to engulph the whole philosophy that concerns the labyrinth of the organic functions in their connection with the nervous system. But it is a word of such partial import as not to convey the slightest connection with pathology and therapeutics; but, on the contrary, to impress the belief that it is limited to the natural state of the body. It disregards all the modifying influences of the nervous system upon organic actions and their products, whether induced by remedial or morbific agents; and the inappropriateness of the term, beyond its mere physiological import, may readily be seen should any one attempt its introduction into any of the pathological or therapeutical branches of Dr. Paine's Institutes of Medicine."

From the Virginia Medical Journal, July, 1858.

"In these degenerate days, when all men bow to the sway of public opinion, and are more prone, alas, to be ruled by policy than to follow the guidance of reason and judgment; in these latter days—when the voice of the people is the voice of God, we, at least, should not withhold our praise from him who fears not to stem the current of popular opinion, and who strikes a bold blow in defense of the right. However we may wonder at his hardihood, and hesitate to follow his rash example, we involuntarily admire this uncompromising devotion to his own doctrines, and respect the courage we are too timid to imitate. The author of the work we have now under consideration is emphatically such a man as we have endeavored to describe. At a period in the history of medicine when the mind of the profession is running like a torrent under the guidance of Andral, Louis, and the other brilliant leaders of the pathological anatomists, into the humoral theory of disease—when, too, the reaction against the heroic school of medicine had reached to such an extent as to favor the rise and temporary success of the infinitesimal dogma, and, more important than all—when the progress of organic chemistry is startling the minds of men with its bold innovations and brilliant theories in physiology and pathology, it was then that Dr. Martyn Paine, almost alone, with nothing to support him save his indomitable energy, his great learning, and his intrepid heart, stood up before the medical world in defense of the waning school of vital physiologists and the time-honored solidism of Stahl and Hunter—when medicine expectanté was most triumphant he still advocated blood-letting and the administration of remedies on the heroic plan—when Liebig, Thompson, and Lehmann unite in leading the student through the attractive investigations and plausible theories of zoochemistry, Dr. Paine still gallantly defends the creed of Bichat and the vitalists against all comers, and charges boldly and effectively upon the ever increasing ranks of the humoral pathologists.

"It is justly due to this learned and zealous investigator and medical philosopher to say that we do not believe there can be found another man in America who would have waged this unequal war for so long a time and with such signal ability; and although we doubt whether many of our readers have ever devoted time enough to his various books, tracts and essays to enable him to do justice to his labors in medicine, yet we will point to every thing which has emanated from his pen as being characterized with an amount of learning, profound reasoning, and a power of resistance equal to the emergency. * * We can not but be astonished at the amount of ground traveled over by this zealous student, and we may point him out to the young in the profession as a noble example of what may be accomplished by those who will imitate his industry and perseverance after knowledge."

The August Number of the foregoing journal contains the able article to which reference is made under our extract from the New Hampshire Journal of Medicine.

From the American Journal of the Medical Sciences, Philadelphia, July, 1858.

"Dr. Paine's Institutes of Medicine presents throughout ample evidence of the general erudition of its author, his habits of close investigation, and his intimate acquaintance with the subjects of which he treats, and with the views entertained by others in respect to them. A degree of originality and independence of thought pervades all his teachings, whether these have reference to the vital conditions and functions of the human organism, the laws by which they are governed, or to the nature, causes, and tendencies of disease, and the curative measures by the agency of which this may be best conducted to a favorable termination.

"The Institutes of Medicine as presented by Dr. Paine, whether we receive them as true, or reject them as false, are, nevertheless, based upon a truly philosophical investigation, aided by all the accumulated light derived from the observations, experiments, and reasoning of preceding and contemporary authorities, of the physiology, pathology, and therapeutics of the human subject.

It is, we confess, somewhat cheering to meet with one of the high intellectual endowments of Dr. Paine, who, at the present day, when the doctrines of physiologists, pathologists, and therapeutists are alike verging into materialism—when the organic functions, at least, of the animal organism are all referred to a mere modification of the same action and reaction which occur in brute matter, has sufficient courage to raise his voice in defense of the vitality of the system; in recognition of the fact that our or-

gans are built up and maintained in a healthful condition for the regular performance of their appropriate functions by a principle which we denominate life, and by which the material elements of the animal organism are almost entirely removed from out the control of those merely physical laws to which, as dead matter, they would necessarily be subjected.

"We consider the treatise to be one well worthy of an attentive study on the part of every advanced student and practitioner of medicine, to whose notice we earnestly recommend it. Although far from being inclined to indorse the accuracy of every doctrine advanced by the author, nor the chain of reasoning by which he attempts its support, we are, nevertheless, convinced that his prelections, from the amount of truth set forth in them, and the *vitality* by which they are pervaded, if they do not actually convey sound views on every thing that relates to the philosophy of medicine, can not fail to lead at least to a correct basis for the establishment of such views. The strong conservative predilections of Dr. Paine, which induce him to subject every new observation and theory in medicine to the severest scrutiny, and to refuse its admission until positively established, can have no other than a favorable influence upon his readers, by teaching them to be *progressive* only in the road of positive truth.—D. F. C."

From the North American Medico-Chirurgical Review, September, 1858.

"No one can read the *Institutes of Medicine* without being filled with respect and even admiration for the profound erudition, the painstaking and systematic research, and the laborious reflection exhibited so abundantly in its pages. With careful and discriminating hands Dr. Paine has gathered together, from the writings of both the earlier and contemporary physiologists, the numerous important facts and details which constitute the subject-matter—the crude material—so to speak, of his favorite science, and arranged and built them up into a stately edifice—the Institutiones Medicinæ—whose great corner-stones are Physiology, Pathology, and Therapeutics. We conclude our remarks by earnestly recommending his work to the careful perusal and study of every one interested in physiology, whether in its aspect of a pure or an applied science. The breadth and comprehensiveness of many of its doctrines, the great questions in which it abounds, and the consummate skill and learning with which these are generally treated, stamp it as a valuable treatise which should find a place in every philosophical library and be consulted by every physician who practices his profession as a science and not as an empyrical art."

From the Medical and Surgical Reporter, Philadelphia, May, 1858.

"Dr. Paine gives us two very copious Indexes and an Appendix to his Institutes of Medicine, and we find throughout the work constant references from page to page to facilitate the task of the student in acquiring a complete knowledge of every subject. Finally, as a postscript, he details in full what he claims as his own, and we think we can not do better than lay his claims before our readers.

"In his Preface to this fourth edition Dr. Paine says: 'This work, originally published in 1847, remains without change, as the author has seen no reason to modify any of his doctrines.' But in his Appendix he does ample justice to all subsequent discoveries in physiology and chemistry. He says: 'Whatever may have been subsequently disclosed in physiology and chemistry is essentially in harmony with all that the author incorporated in the foundation upon which his Institutes are erected, and places them beyond the probability of being much invalidated. In his discussion of organic chemistry as applied to physiology, pathology, and therapeutics, it is evident that he could not doubt that this invasion upon medicine would prove ephemeral, and that the chemist would soon retreat into the appropriate field of nature.'

"He reviews very thoroughly all the evidence connected with this statement, and certainly shows good logical reasons for his views."

From the Charleston (S. C.) *Medical Journal and Review*, July, 1858.

"Few men have labored more constantly, more earnestly, and with more singleness of purpose than the venerable and learned author whose late edition of the Institutes of Medicine now lies before us. * * The arrangement of the work is exceedingly systematic and satisfactory. Step by step the reader is led on from the study of the functions as they exist in health to the causes and consequences of their derangement, and to the methods of treatment adapted to them.

"Professor Paine's style is at once vigorous, bold, and classical. Stating in few words the thought which he would convey, he does so in such a manner as not to allow it soon to be effaced. His writings are every where characterized by perspicuity and terseness; and if his meaning is not understood (as may often happen) it is not due to the faulty expression of it, but to the fact that he deals with subjects of great depth and difficulty of comprehension—beyond the span of many minds, above the reach of all, unless close attention and undeviating thought be given to their study. The reader may at first find some difficulty in following the writer, but he will soon become accustomed to his style, and read with interest and facility."

From the Boston Medical and Surgical Journal, May, 1858.

"One can not fail, in reading Dr. Paine's Institutes of Medicine, to be struck with the immense industry of the author, with his originality, and with his consistency; and if we must differ from him in some of his views, we do so with the diffidence due to a learned and conscientious teacher."

In a subsequent Number (July 29th) it is said by "W. E. C." of Dr. Paine's Medical and Physiological Commentaries:

"The first peculiarity of Dr. Paine that arrests us is the solid, methodical manner in which he plants himself at his work—the thorough *à plomb* which he establishes for himself before he grapples with his subject-matter. You feel assured of this in the first ten lines you read. It is not going to be any trifling affair, you are at once convinced. It is a brawny student of the old very old sort you have got into companionship with, and if you wish to keep his company you must buckle yourself closely to the matter before you, and set yourself to hard work.

"The scope he has taken is our next point of note. This is not only shown by allusions and casual references in the text, but the foot of almost every page in the book has quotations, with chapter and page, from apparently every work that can possibly illustrate the subject or enforce the writer's views, including not only accredited books, magazines, and monographs in our profession, but those from every walk of literature, giving us a high opinion of the author's cultivation of pursuits too often neglected by medical

men. These are used, too, not, as is often the case, simply to set off the text and suggest ideas of the research of the writer, but as genuine illustrations either of the matter in hand and the peculiar view of it taken by the writer, or of the mental temperament of the time in which the doctrine or its converse was first propounded. In short, the book is not that of a sciolist, by a great deal, but of a thorough and strong scholar, from whom very contact with whom strength and refreshment may be derived, even if difference of opinion should exist and remain after it.

"As we have said, it is impossible to review here such a work as Dr. Paine's, but we may give an idea of some of its contents, &c., &c.

"A Dissertation on the Hippocratic and Anatomical Schools, and another on the writings of Louis, conclude the second volume. The last paper is as remarkable and as characteristic as any thing in the two volumes; of and in itself it shows fully the scope, power, and variety of the scholarly Author. We will not comment upon it, but earnestly recommend a perusal of it, and in return for our good advice would only like to watch the countenances of certain friends of ours well engaged in the recreation."

From the Montreal Medical Chronicle, September, 1858.

"No one can peruse these volumes of Dr. Paine (the Institutes and Commentaries) without being forcibly impressed with the vast amount of erudition displayed by the learned Author. Every page bears witness to an extent of reading and research really surprising. It is not only the standard medical works in various languages that he has consulted, but periodical literature has been thoroughly ransacked to discover new thoughts, truths, and experiments in support of and bearing upon the peculiar views he advances.

"As we agree in the main with the vitalists, although differing from them in some respects, and as we admit the vast importance of much that is taught by the zoo-chemists, we shall endeavor to give our readers, in as few words as possible, the view we take of life."

From the Buffalo Medical Journal and Review, September, 1858.

"The Institutes of Medicine first saw the light at a time when the humoral and chemical doctrines of life were in the ascendancy, and when vitalism was scouted as an obsolete relic of bygone ages. But now, when the opinion begins very generally to prevail, that the physical doctrines of life will not suffice for the satisfactory solution of the varied phenomena of organic beings in health and disease, nor for the explanation of the *modus operandi of remedies*, there is evidently a commencing reaction in favor of the doctrines of vitalism; and this work, and the 'Commentaries' of our author, begin to be sought for with avidity. This must be greatly gratifying to Prof. Paine, who, with far-reaching foresight, saw very clearly that a system of medical philosophy, based on the laws of the inorganic world, could not stand when brought to the test of observation and experiment. On reading the 'Institutes,' we can not but be struck with the admirable consistency of the author's views throughout the entire work. The same principles, the same philosophy form the foundation and substratum of the whole. There is no inconsistency, no contradiction, not even the shadow of any clashing throughout. Taking up each topic in its natural order, as each successive one emanates from, or depends upon, the preceding, there is a lucid order every where displayed—a chain, with no broken link. As in a mathematical demonstration, each step prepares the way, and is necessary for the succeeding. The demonstration proceeds with logical exactness and unbroken sequence, till the conclusion rests on a basis impregnable as truth itself.

"As the author truly remarks, this is the first effort that has been made to present the natural relations of the whole subject of the institutes of medicine, including physiology, pathology, and therapeutics in their just order—to point out the affinities, and to exhibit throughout the important laws and essential foundations of vitalism and to maintain throughout a consistency of facts and of laws that shall stamp the whole as the *philosophy of medicine*. This has been most successfully accomplished; and the zeal, learning, and genius displayed in its accomplishment will forever stamp the author as a leading spirit in our profession—as one of the great masters in our art. If the work bear something of a controversial aspect, it was unavoidable in carrying out the great design of the writer. A simple expression of facts, of experience, and of philosophical doctrines, would not have sufficed. It was necessary to expose and refute the errors with which the subject was environed."

In an extended analysis of the work, the reviewer enters upon the author's original views of the nervous system, and more specifically as to the "excito-secretory system," showing that even the term itself was derived from writings of his as early as 1842, but that he regarded it as only a small part of the influences exerted through the same system of nerves, and quotes the author extensively to this effect. "No one," says the Reviewer, "can read Dr. Paine's Institutes without being satisfied that '*excito-secretory*' is every where comprehended in what is set forth as to the general organic influences of reflex action. The grand doctrine is again and again reiterated in every part of the work, as on page 661," &c.

"It is not too much to claim for our author and countryman that, with unsurpassed acumen and ability, he has abundantly established the fact that secretion in animals is conducted by powers implanted in every part, but that it is constantly influenced physiologically, pathologically, and therapeutically, by reflex action of the nervous system."

From the Southern Medical and Surgical Journal, Augusta, Ga., August, 1858.

"Of all American writers none has been more indefatigable and laborious than Professor Paine, and the works of but few, either in this country or in Europe, display a greater amount of learning than we find enriching both the Institutes and Commentaries of this perhaps most recondite of American authors. On opening any of his works we may be said to be at once 'lost in a sea of erudition,' and his copious references to the authors of every country and every language attest his familiarity with the general literature of the science. * * In an age when Humoralism and Organic Chemistry are threatening to displace all other views of physiological and pathological action, this work, *because* it is *ultra* in its vitalism and solidism, must exert a most salutary influence upon the history of the medical opinion of the present and the rising generation. It requires no half-way assertion of the power of nervous action to gain its admission; but he who would advocate its unmodified sway, as Dr. Paine does, must be as firm and uncompromising as he has been throughout the comprehensive work before us. The present edition has been prepared, apparently with great care. A most copious analytical index much enhances the value of the volume, and attests well the perseverance and industry of the author."

From the Memphis Medical Recorder (Tenn.), March, 1853.

"All praise, we say, to those pathologists, with Professor Paine at the head of them, who so long and so ably kept alive the anticipation that it was through the reactions of various departments of the nervous organization, one on the other, that pathological and physiological sympathy resulted. * * In America no earlier or more sedulous laborer in this field can be pointed out, as we think, than Professor Paine; whether discussing the principles of pathology, or physiology, or therapeutics, it has been the distinguishing merit of this writer always to keep steadily before his mind the probable influence of reflex nervous action in the production of the phenomena he may be treating of. * * Especially has he acquired well-won laurels by the use he has made of this principle in the controversy with the mere chemical theories upon which the influence of Liebig was leading men to ground all explanations of vital or even mental processes."

From the Nashville Monthly Record (Tenn.), September, 1853.

After commending the Medical and Physiological Commentaries, Professor Wright remarks that:

"It is in the Institutes of Medicine that the great principles of vital physiology and pathology are broadly and systematically stated. It would be impossible for us, if we had much more space than we have, to give any thing like a satisfactory analysis of this profound and inestimable work. We will only say that if our whole system of medical philosophy has escaped being overwhelmed by the confident dogmas of the chemical school; if we have learned to look for perverted forces rather than vitiated material in pathology; if our younger writers see more of the nerves in diseased and healthy action and less of ferments and catalyses than they did a few years ago, then he who desires to assign the palm to him who wielded the sword while there were none to stand by him, should cast a glance back at the Commentaries and Institutes of Martyn Paine before pronouncing his decision."

From the Nashville Journal of Medicine and Surgery, July, 1853.

"The Institutes of Medicine, the Medical and Physiological Commentaries, and Essays on Vitality and Remedial Agents, are the titles of some of the works which have obtained for Dr. Martyn Paine the well-earned name of the great New York Physiologist. The first of these is a work of no ordinary merit, filled with the marks of profound scholarship and genuine philosophy, covering the entire field of medicine, and teaching it as a harmonious whole. * * We can confidently recommend the Institutes as a treasury of learning and invaluable Cyclopædia of medical knowledge, well calculated to lead the student into paths of logical instruction and habits of sound reasoning, as well as instructing him in medical science."

From the New Hampshire Journal of Medicine, July, 1853.

"It would be impossible to review this immense book in less than one hundred pages. It is a monument of the learning and industry of its author, and is full of valuable facts and profitable suggestions."

The August Number of the same periodical copies from the *Virginia Medical Journal* an able, elaborate, and thorough defense of Dr. Paine against the misrepresentations of an English Reviewer, with the following prefatory remark: "No apology is necessary for occupying our pages with this long article. The justice of the views here expressed, both in relation to Dr. Paine's works and the English reviewer will be apparent to all."

From the Atlanta (Ga.) *Medical and Surgical Journal*, September, 1853.

"In these works (the Institutes, Commentaries, &c.), are embodied the views of one of the most laborious and learned medical philosophers of this or any other country upon the complicated theories in physiology, pathology, and therapeutics, in reference to the great principles and laws of organic being. * * We commend their contents in the most decided manner, as in the highest degree worthy of the most thorough investigation. * * Notwithstanding, however, our great respect for the autnor of these works, we do not desire to be understood as committing ourselves to his views, being, as he is, the peculiar defender in this country, of what we conceive to be (as we understand them) the erroneous doctrines of Solidism and Vitalism."

From the College Journal of Medical Science, Cincinnati (O.), July, 1853.

"However much we may differ with the author upon some points, we feel that the *Institutes* contains a mine of knowledge within itself, and bears the imprint of the close student and original thinker. We think, in recommending the book to our readers, that we are conferring upon them a personal favor."

From the Oglethorpe Medical and Surgical Journal, Savannah (Ga.), June and August, 1853.

"This work enjoys celebrity among the graduates of the University of New York, and has been favorably received by the profession generally."

The same journal says of Dr Paine's *Medical and Physiological Commentaries* that "No work written in this country has fallen under our observation, to which the terms *learned* and *able* could be more appropriately applied than to this production of the mind and pen of its accomplished author."

From the New Orleans Medical News and Hospital Gazette, July, 1853.

"In our last number (which we have not seen) we noticed Professor Paine's *Institutes of Medicine*. We have now to make our acknowledgments of the foregoing valuable works (the Medical and Physiological Commentaries, and Essays on Vitality and Modus Operandi of Remedies), which are most welcome to a place in our library. We only regret that the size and objects of this journal preclude our giving a more extended notice of the whole of these valuable works."

From the Peninsular Journal of Medicine and Collateral Sciences, Detroit, March, 1853.

"We bespeak for this enlarged edition of the *Institutes of Medicine* a hearty reception and a studious reading."

From the Cincinnati Lancet and Observer, October, 1858.

"No name in American Medical Literature occupies a more prominent or worthy position just now than that of Professor Martyn Paine; no works have been reviewed in our medical journals which have exhibited such profound learning, such industry, such extended research. The works, whose titles are given above (The *Institutes, Commentaries, and Essays on Vitality and Remedial Agents*), embrace a period of almost twenty years, from their first to their last dates of publication, and the most superficial reader can not but bear witness to the singular unity of design in the entire series of works, as well as to their careful maturity, for which so few medical writers of the old or new world have labored, and to which so few arrive. This testimonial to the genius of Paine, in which the medical press of America so cordially unite, is the more memorable when we call to mind the obstacles which he has encountered, the elements of opposition through which he has advanced to such honorable position. Twenty years ago the mechanical and chemical doctrines of physiology, whereby it was sought to abandon the idea of a distinct *Principle of Life*, were largely adopted by leading philosophers of the world; but, in the very face of those prevailing doctrines, Paine became at once, always—and always consistently—eminently the champion of vitality and solidism. These two ideas are the fonndation and key-stone of all his views. He had the wise foresight to anticipate that the prevalent opinions of twenty years ago were unstable; and though slowly working his way onward and upward, his ultimate triumph has proved the highest tribute to his geuius and scholarship."

"To the laborious thinking student of medicine every where we commend the writings of Martyn Paine."

From the Maine Medical and Surgical Reporter, January, 1859.

"Dr. Paine discusses (in the Institutes) with marked ability the points of difference between the vitalists, of whom he is the most distinguished exponent, and the chemical physiologists."

"The arrangement (of the subjects) is philosophical, and, if we admit the premises of our author, we are forced by his admirable and logical reasoning to admit the correctness and truth of his conclusions."

From the Peninsular and Independent Medical Journal, Detroit, Michigan, February 7, 1859.

"We may safely say that this work (the *Institutes of Medicine*) is not second to any one of the kind in the language, if any can be found of equal merit."

"A profound and methodical thinker and an erudite philosopher, Dr. Paine has shown consummate skill in presenting his favorite and truthful theory of *Vitalism*, as opposed to the chemical and mechanical doctrines of life."—N. D. S.

From the New York Medical Press, January 22, 1859.

"This elaborate work (the *Institutes*) displays in every page the profound learning, immense research, and sound philosophy, of the venerable and distinguished author. It is, at the same time, a triumphant refutation of the false doctrines of materialism, and other kindred theories."

From the Pacific Medical and Surgical Journal, San Francisco, California, December, 1858.

"Is there a science of Medicine? We think there is, but it is, like the tomb of Moses, unknown to this day." "The facts exist; but they are not acknowledged by all; they are not classified," &c.

"Our author has attempted, in these *Institutes*, to give the philosophy of medicine. He has succeeded in giving more of the true philosophy of medicine than has ever before been given in any work. There is order, sequence, and harmony to an eminent degree in this work. It is an edifice, and though not an Egyptian pyramid, it is still a magnificent structure, which few men in our profession could make in greater perfection, or in more ample proportions."

From the Medical Journal of North Carolina, April, 1859.

"These are works (The *Institutes of Medicine* and the *Med. and Physiolog. Comm.*) of vast research, of the most extensive erudition, and of wonderful ability, reflecting the greatest credit on their author, his country, and the profession of which he is a member. They embrace, in fact, the whole arcana of medical science, containing full expositions of every department included in the professional curriculum, presenting learned and erudite treatises on all topics of interest to the physician, and offering so wide a field for contemplation and study as to fill us with surprise that one man could have accomplished so much. There is an unpretending simplicity in his style, too, which is very pleasant and attractive, especially in these days of bombastic inflation and pedantic superfluities. In fact, Dr. Paine's works are a success, and not even the most carping critic can deny the fact without proving himself too ignorant and malicious for his office. As regards the great subjects of 'solidism,' 'humoralism,' 'vitalism,' &c., which are so extensively discussed in these books, we have neither the time nor space to consider them at present, but can only say that Dr. Paine sustains his views with wonderful plausibility, erudition, and ability. No physician should esteem his library complete until these three admirable works have been added to it. not as a mere ornament or for the name of the thing, but to be studied carefully and continuously, as well as in that spirit of exultation which the pre-eminent success of a fellow-countryman must engender in every patriotic bosom."

From the Baltimore (Md.) *Journal of Medicine.*

Professor E. WARREN, M.D., the editor, remarks that "Dr. Martyn Paine is, by all comparison, the most able and erudite of American authors, and the special champion of those great doctrines of Vitalism and Solidism, to the advocacy of which we stand at all times committed."

From the Cincinnati Lancet and Observer, September, 1868.

"The magnificent achievement before us contains the labor and brains ordinarily spread over the construction of a whole library of medicine."

"We know of no book in our language which gives evidence of such extended learning."

From the Detroit Review of Medicine and Pharmacy, July, 1868.

"The volume is a library of philosophical and practical medicine." "The Doctor's Note, *Rights of Authors*, settled the question. The work will stand the test of time like the old granite hills of New Hampshire. It can never meet with any successful opposition.—N. D. S."

NOTICES BY DISTINGUISHED

NON-PROFESSIONAL JOURNALS.

THE Physiological Articles in this work having attracted attention beyond the limits of the profession, the following extracts from Notices are selected from distinguished journals which are not medical, but in which the Notices were evidently written by those who had studied the work, and which, therefore, embody public opinion.

From the North American Review, April, 1863.

"This work covers the entire ground of physiology, pathology, and therapeutics, and, logical in arrangement, minute in subdivision, affluent in references to other books, and continually referring back and forward to its own pages, it constitutes an admirable system of medical science. This were ample praise. But in addition to this, the successive subjects are treated by Dr. Paine with great conciseness, indeed, but with great vigor and earnestness, with frequent originality, and in a style which shows that, when his opinions coincide with those of others, they are yet his through the independent action of his own mind. Then, too, if he agrees with no one else, he is uniformly consistent with himself, his conclusions following legitimately from his premises, and his views on allied departments of science or art bearing tokens that they belong to the same system, and rest on parity of reason."

From the Methodist Quarterly Review, April, 1863.

"Of the two great schools, namely, the Chemical and the Vital, Dr. Paine is a leader if not the head of the latter." "From the high character of the chemical theorists, and the plausibility of their pretensions, they seemed, for a while, to carry with a rush every thing before them. Medical science was thus tending to a system of low theoretic materialism. Against this torrent Professor Paine has stood firm as a column of adamant." "Whatever may be his peculiarities of belief, all parties must bear testi ony to his learning, genius, individuality, and pure independence of mind."

From the American Quarterly Church Review, April, 1863.

"In the Appendix the Author attempts to demonstrate the substantive existence of the Soul and the Instinctive Principle upon physiological grounds. The demonstration is exceedingly able, and refutes effectively, we think, the materialism of the day, by which infidels would rob the soul of its immortality."

From the Boston Review, March, 1863.

"Its strong points are a broad and thorough treatment of the whole science of physiology, pathology, and therapeutics; a sturdy conviction of the soundness of its positions; a clear understanding of the opposing theories; and a vigorous, classic, concise, and unflinching style of writing."

"In a labored supplementary dissertation he contends with great cogency for the distinct existence and immortality of the soul, against the materialists and all who, confounding reason with instinct, push us downward toward annihilation."

From the New York Evening Post, August 8, 1863.

"Dr. Paine's works are of the highest order of medical scholarship. The volume before us requires no praise. It is a most valuable magazine of therapeutical sciences, containing, as it does, the results of thorough investigation which are here carefully digested and applied. The learned author discards utterly any dependence upon organic chemistry for the prosecution of physiological or pathological research, and proves his positions by quotations from Lehmann.

"The most curious chapter, for metaphysicians, will be found in the Appendix, where Dr. Paine has embodied an essay on the 'Soul and Instinct, physically distinguished from materialism.'

"Many of the positions taken by Dr. Paine are original with him. He is a physician of extraordinary attainments; and his works have been liberally copied from at home and abroad."

From the New York Daily Times, February 7, 1863.

"Professor Paine's *Institutes of Medicine* are based on broad and prominent principles of Nature." "'Solidism and vitalism,' the book opens, 'will form the basis of these Institutes;' and to the elucidation of these time-tried doctrines, and to their defense against Chemical Philosophy and kindred neologisms, he brings the results of long and severe investigation and eminent knowledge. He does not scruple to enter the lists and try his lance against the glittering armor of LIEBIG and HUMBOLDT, and it is apparent to every one that the blows are well aimed, and the weapon impelled by a stout arm, guided by a clear eye, with a vigorous brain behind it." "We do not pretend to commend the work to the Profession. It is already thoroughly appreciated there. But there are now such a large number of non-professional students and investigators in this field of research that we wish to call attention to this new edition of a standard professional book." "In a very entertaining chapter on the 'Rights of Authors,' in which Professor Paine dissects the claims of those who pretend to have antedated him in the discovery of some valuable principles, and in the statement of some important theories, he clearly shows his priority in research, discovery, and promulgation of the doctrines in question."

From the Taunton (Mass.) *Gazette*, February, 1863.

"This massive work is alike remarkable for the range of its learning and the vigor of its logic. We feel, as we read, that Professor Paine is not only vast in his sweeps, but unerring in the return of his curves. As an inquiry into what is so far known of the treatment of diseases as to have been demonstrated by long and enlightened practice, this elaborate work is most thorough in its array of facts, and singularly vigorous in its reasoning. It is emphatically a student's book; and yet no one capable of drawing an inference from premises, and of understanding how premises should be established, can read these 'Institutes' without growing in wisdom on the subject, if he do not find cause to cast out some crude and perilous opinions which he had previously entertained. Certainly, so antagonistic are curative theories, that it behooves every man to inquire for himself; and nowhere can he look with more satisfaction for the legacies which all the ages have bequeathed to the healing art than in this volume."

From the Philadelphia Presbyterian Standard, February, 1863.

"Dr. Paine does not do himself justice, as this, instead of the seventh, is really the eighth edition of his great work."

"After twenty years' acquaintance with the schools of Edinburgh, Dublin, London, and Philadelphia, we feel warranted in saying that we have seldom met with any single work that is better calculated to stimulate an active mind that is really and earnestly engaged in the pursuit of medical knowledge than in this work of Dr. Paine now before us. Dr. Paine grasps every subject with the hand of a giant." "The student who masters this book, if he have a capacity to comprehend demonstration, will never confound our material organization with that which dwells within it."

"We commend this really learned, manly, and wonderously suggestive treatise to all our young medical friends; and in order that some hundreds of them may know our estimation of its value, we shall take care to have this, our judgment of its merits, made known to the medical schools of this city."

From the American Presbyterian, Philadelphia, 1863.

In a second notice of the seventh edition of the Institutes, the writer says that: "A careful examination of this work shows the author to have a fine mind, highly cultivated, and ardently devoted to the advancement of his profession. He seems to have read and carefully digested almost every thing of value written upon it. Truth is ever the object before his mind, and while he states his own opinions strongly, we admire the fairness with which he presents the views of those opposed to him." "The principles of the work will be a safe guide to the active physician, and may be trusted in cases of doubt and danger."

From Zion's Herald and Wesleyan Journal, January, 1863.

"We commend the 'Institutes' to physicians and to scholars of all professions. It should be in every public library."

"The arguments to show from physiology that the mind is a spirit, and the revelation of its immortality is reasonable, are original and profound, and very strongly expressed."

From the New York Observer, January 7, 1863.

"The medical student makes the Institutes of Medicine his text-book, and every intelligent person who reads it with attention finds a field of knowledge opened up to his mind that constantly furnishes him most important and useful instruction. It is often said that when a man begins to read medical books he imagines himself the victim of all the diseases he reads of. Such a philosophical work as this will not leave him liable to an evil like that, but he will learn those great principles on which health and life depend."

From the New York Sunday Times, January 11, 1863.

"Dr. Paine's discussion of the vital principle and its properties will deeply interest many a reader besides medical practitioners and students, and his whole treatment of the subject of organic philosophy will be found at once able, eloquent, erudite, and full of remarkable originality." "Physiology, pathology, and therapeutics, with all their relative branches of study, are elaborately treated in these 'Institutes,' and an extraordinary amount of information is given on the subject of physiological and pathological chemistry, the production of animal sugar, the absorption and circulation of plants," &c.

From the New York Evening Express, January 10, 1863.

"A most valuable book the 'Institutes' must be for the practical physician, as well as a most amusing and instructive one for the general reader."

From the New York Christian Times, January 22, 1863.

"Criticism is not the thing required in respect to this learned and philosophical volume. It is sufficient that we call attention to this as the seventh edition of an *opus magnum* of the highest authority among medical men. Its author is both known and honored as the patriarch of American physicians, and as a savan of whom the profession is justly proud."

From the New York Commercial Advertiser, January 13, 1863.

"This seventh edition of the 'Institutes' is the author's legacy, more valuable than rubies, to his brother physicians and their successors. Successful will he be who studies and follows its teachings."

From the Congregationalist, Boston, January, 1863.

"The Institutes of Medicine is an invaluable repository of scientific information and a lasting monument of the author's industry, skill, learning, and genius. He enters on his work with the facility of an adept and the vigor of an athlete. Entertaining a lofty scorn of empiricism, he slowly gathers fact on fact, piling them up into a firm foundation for the temple which he would rear, whose solidity, proportions, and effect, we can not fail to admire." "To his opponents, as well as to his adherents, the book must be of an inestimable value. Symmetrical in plan, exhaustive in detail, clear in style, devoted in spirit, it is at once suggestive and satisfactory."

From the Buffalo (N. Y.) *Journal*, 1863.

"Even to non-professional eyes a cursory glance over the pages of this great work reveals, to some extent, the herculean labor which its preparation must have involved. The work before us is not only a complete digest of all that is known of the limitless subjects it discusses, but, venturing boldly beyond the sphere of previous explorations, Dr. Paine has brought in a harvest of discoveries, by which science is enduringly enriched." "It is not necessary that we should say more in commendation of so noble a contribution to science. We make but few books like this in America, and such as are produced on this side the Atlantic, for the sake of our National fame, if for no higher reason, should be received with due pride and appreciation."

From the Worcester (Mass.) *Palladium*, February, 1863.

"The excellent portrait, prefixed to the 'Institutes,' indicates the character of the man; one who is an acute observer, who takes no superficial view of subjects, but investigates deeply and widely, finding the causes of phenomena, however profound may be the research required, and tracing those causes to all their consequences, however intimate or remote; with that moral courage, none too common among men, that reaches conclusions emphatically its own, and has no hesitation in the avowal of convictions deliberately formed. From such intellectual power, cultivated mainly by its own effort, and acting upon the dictates of its own independent judgment, such a volume as this, where there is the requisite mental activity, comes as naturally as the ripe corn comes from the principle of life in the germinating seed."

From the Detroit (Mich.) *Daily Tribune.*

"We may safely say that this work is not second to any of the kind in the language, if any can be found of equal merit. It shows that the author is an indefatigable student. Nothing in Physiology or Philosophy, or any thing belonging to the subject, has escaped his eye. A profound and methodical thinker, and an erudite philosopher, Dr. Paine has shown consummate skill in presenting his favorite and truthful theory of *Vitalism*, as opposed to the chemical and mechanical doctrines of life, frequently bringing his subject to bear in favor of revealed religion, as opposed to materialism and sensualism. He has grappled with the abstruse principle of instinct and the substantive immateriality of the human soul, which has escaped the notice of his reviewers. In proof he has brought to bear arguments entirely new, and we think unanswerable. The Dr., in placing this work before the public, has done the professors of medicine and theology great service. On this account the work should be found in every clergyman's library as well as that of the physician. The profound scholar and painstaking lover of truth will find a rich treat in reading this work.

From the "Annual Address before the Alumni Association *of the Medical Department of the University of the City of New York*, 1870, *by* Professor James R. Leaming, M.D."

"Large and indiscriminate dosing is of the past. When Dr. Martyn Paine came to New York, a young man, he commenced the treatment of disease by withholding medicine, except when it was plainly indicated, and then applied it with successful wisdom. The foremost men of that day were astonished, and prophesied that the innovator would have but a short professional life, so strongly were they wedded to the old way; but, instead, he gathered about him a host of warm friends and admirers, and made his mark upon the practice of the time, and the day of indiscriminate dosing passed away forever. This was before the day of little pills."

COMMUNICATIONS TO THE AUTHOR.

As an example of letters which the author continues to receive, we submit the following extract of a letter from the eminent Von Dr. Professor N. Zdekauer, Physician to His Majesty the Emperor of Russia, dated St. Petersburg, April 19, 1867.

"Your valuable works are very often studied by me, and I look on them as on an Enchiridion of Medical Science and Philosophy. How wise and practical are your chapters on the Remedial Actions, on Sympathy, and all the chapters on Pathology! But your greatest merit is to have in a most rational manner treated about Vital Principles and Powers, contrary to the most material and dead-born tendencies of the newest authors."

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